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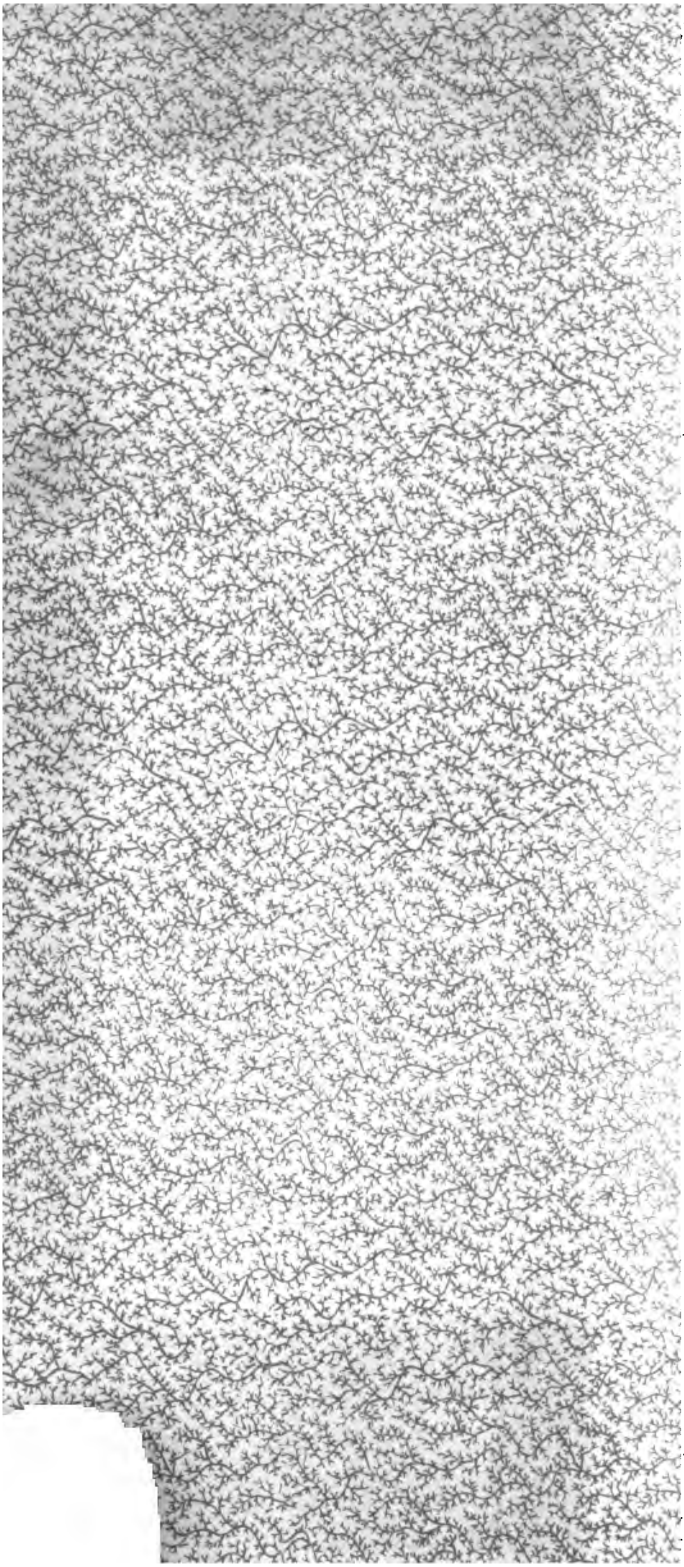

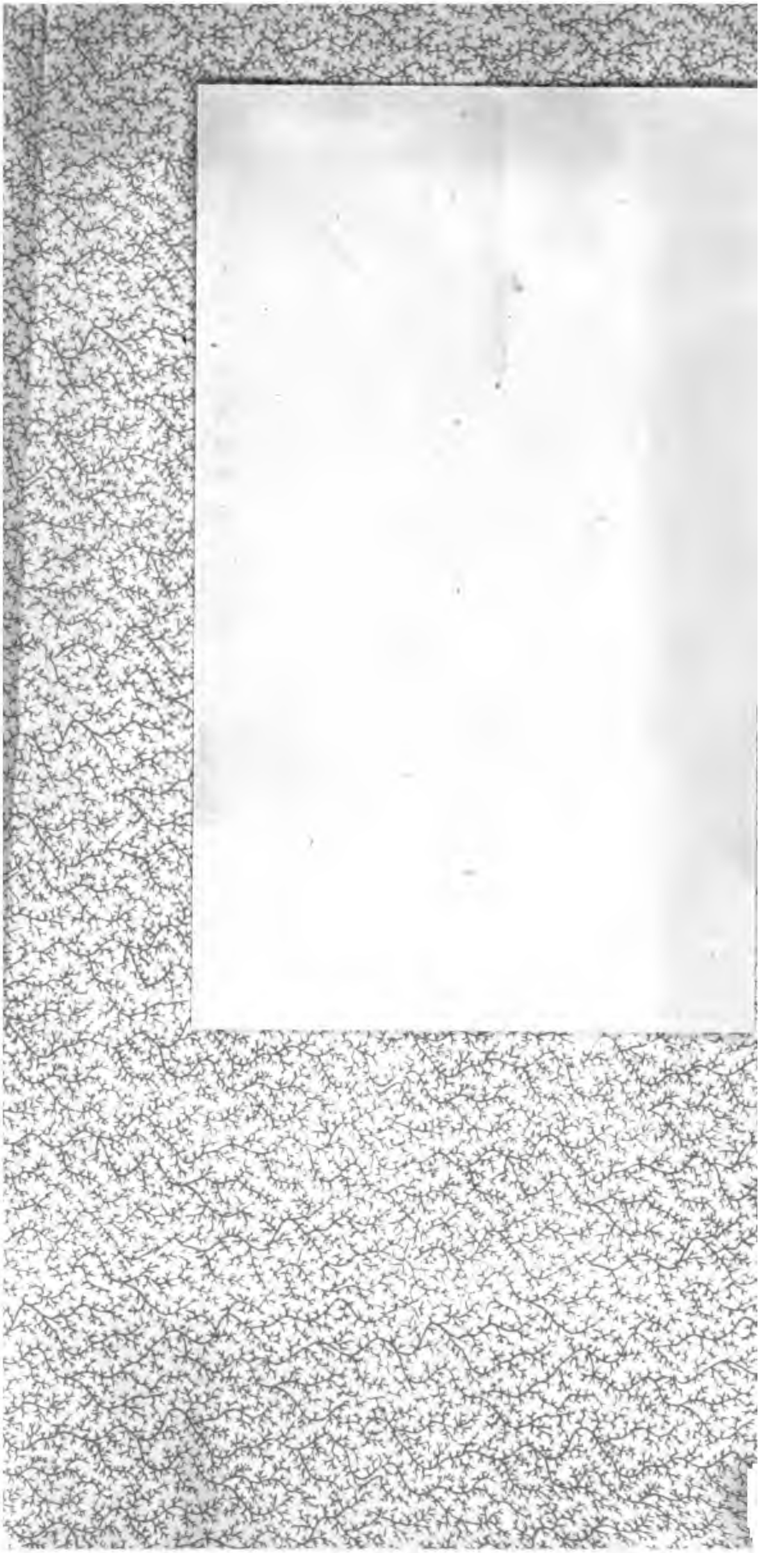

# Physical and Metaphysical
# INQUIRIES,

BEING AN

## ESSAY

TO

## *INCULCATE THE RATIONAL SYSTEM*

OF

## DEISM.

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By WALTER MILLER.

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London:
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1819.

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# Publiſher's Preface.

From some unknown cause, this Work has been locked up in the cellars of Messrs. Longman, and Co., for the last ten or eleven years, until Mr. Miller, the son of the Author, with a laudable zeal for this offspring of his Father's genius has drawn it forth, and again presented it to the Public. The Author has lately died, and the following Memoir and Eulogy which appeared in the Monthly Magazine, for May last, will, no doubt, display the character of our Author better than any opinion we can presnme to give of him.

# Brief Memoir,

## &c.

Mr. Walter Miller, merchant, of Perth, who lately died at the age of 62, was as remarkable for the incidents of his life as for the singular energy of his mind and character, and the unshaken independence of his political principles. He was one of the most zealous and distinguished of the partizans of reform in Scotland, in the early part of the war against republican France; and was arrested at the same time with Muir, Gerald, Fysche Palmer, Margarot, and other sufferers in the cause; but the prudence and moderation of his previous conduct exempted him from the rigorous penalty inflicted on those gentlemen. Although assiduous in the harrassing details of his business, and conspicuously attentive to his family duties, he also cultivated literature with uncommon ardour and success. His early education had been very limited; and his after-occupations were not only in utter discordance with his studies, but they also, in a great measure, precluded him the leisure and retirement which, with most others, is the essential requisite of mental improvement; yet the natural strength and vigour of his mind supplied the place of all those props and aids of weaker intellects, and enabled him to attain to a degree of sound and discerning intelligence, which even by those who devote their lives to its acquirement is seldom reached. His views of things were clear and comprehensive; and his speculations on every subject, to which he directed his attention, were profound and original. He contemplated his objects from a point of view peculiarly his own; and, although this might not, in some instances, have been the most happily chosen, and his lights in others might have been comparatively imperfect, his powers of vision were eminently strong, his perceptions clear and accurate, and his deductions from these, precise and forcible in all.

Mr. Miller was the able author of several political essays; which, with the events and circumstances that called them forth, have now lost their interest; but his work, entitled "*Physical and Metaphysical Enquiries*," will remain a lasting monument of his genius and power of mind. This last production, though from peculiar circumstances it may be little known, was highly estimated by those who were capable of appreciating its merits, for the novelty and originality of the author's views, and for the acuteness and strength of argument with which he has followed out the subjects treated of: and, although they may not agree with him in the general results he has endeavoured to deduce from his speculations and enquiries, yet they acknowledged themselves gratified and instructed by the profundity of his reasonings, and by the extended range and power of thought evinced by him. It was his intention to have continued and extended these enquiries; and it is to be regretted that the increased difficulties of his other occupations, and his declining health, for many years, prevented their completion. As a man, his conduct and feelings were regulated by the most rigid moral principles; his integrity was never questioned or impeached; and, by those who knew him intimately, his memory will long be cherished and revered. Such a man merits a tablet in the WESTMINSTER ABBEY of the periodical press!

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## ERRATA.

| P. | L. | |
|---|---|---|
| 33 | 15 | *for* It has a peculiar effect, *read* Form has a peculiar effect. |
| 47 | 17 | *after* perceivable, *insert* by the touch. |
| 48 | 27 | *after* magnitude, *insert* by the touch. |
| 51 | 27 | *for* complicated, *r.* extensive. |
| 58 | 7 | *after* body, *insert* in general. |
| 75 | 14 | *for* motion, *r.* self-motion. |
| — | 21 | *for* exerting, *r.* exciting. |
| 76 | 20 | *for* in a state of constant action, *r.* still capable of action. |
| 184 | 18 | *for* dice, *r.* die. |
| 205 | 9 | *for* or, *r.* for. |
| 236 | 28 | *before* connected, *insert* necessarily. |
| 244 | 16 | *for* it, *r.* its ejection. |
| 257 | 10 | *for* perspiration, *r.* respiration. |
| 278 | 16 | *for* longer, *r.* no longer. |
| 292 | 11 | *after* circumstances, *insert* but, |

# PREFACE.

THE ſcience which treats of the laws which regulate inanimate bodies is termed Phyſics, or Natural Philoſophy: but mind forms a world of its own; and imagination exhibits a pictured ſcene, which we muſt always diſtinguiſh from the objects around us. The connections and aſſociations of mind, like thoſe of matter, have been ſuppoſed to be ſuſceptible of inveſtigation, and the name given to this ſcience is Metaphyſics.

To aſſume an hypotheſis, and afterwards endeavour to demonſtrate its truth, conſtituted, till a late period of the world, the utmoſt effort of human reaſon. The reveries of enthuſiaſts held the place of experience; the knowledge of nature was enveloped in a chaos of abſurd dogmas, which became ſacred with the hoar of years, and the influence of authority. It is now almoſt univerſally admitted, that ſcience is not to be diſcovered by any innate proceſs or exertion of the mind, and that the extent of our knowledge of nature can only keep pace with the number of facts and obſervations which have been made. This revolution in human reaſoning was, however, very ſlow and difficult to accompliſh. Ignorance long ſtruggled to keep her hold, and Galileo was doomed to a dungeon.

From whatever cauſes it may have happened, it is certain that the ſcience of metaphyſics has not kept pace with the diſcoveries which have been made in the other branches of philoſophy. It has not yet been freed from the trammels of the ancient ſchool. The ſyſtems which have been formed are ſo contradictory, and the ſubject is involved in ſo much darkneſs and myſticiſm, that moſt men are now deterred from ſtudying it. It has been decried as a collection of the dreams of Folly, and the name has become the opprobrium of philoſophy; ſo much ſo, that one writer cries out in deriſion, 'From metaphyſics good Lord deliver 'me.' There is, however, reaſon to ſuppoſe that the darkneſs of the ſubject is in a great degree owing to the manner in which the inquiry has been purſued; that if the ſame attention had been paid to experience and facts, and the ſame freedom of inquiry and patience of reſearch been employed as upon ſome other branches of ſcience, the ſubject would have been rendered much more perſpicuous.

However much metaphyſics may be neglected, it is the moſt important of all the ſciences to a rational mind. If we find pleaſure and profit in inveſtigating the nature of the planetary motions, and in calculating their diſtances, how much more gratifying muſt it be to inquire into the principles of animal action, and to inveſtigate the phenomena of mind. If the exiſtence of a ſouthern continent, and a northweſt paſſage to India, employed the reſearch of ages, how much more important is it to inveſtigate the exiſtence and character of the Deity. Mind muſt ever be conſidered as conſtituting an important branch of the ſyſtem of nature; becauſe, though we were to limit the idea merely to the mind of man, ſtill it forms a character worthy of the moſt minute inveſtigation; and if there be found ſufficient evidence of the exiſtence of a mind of a higher caſt than is found in man, the inquiry will become the more momentous. It may perhaps be contended, that however deſirable it may be, the labour is likely to be unprofitable, as we have not the ſame means of purſuing the inquiry. But this is by no means a certain or ſelf-evident point. Many things which long defied the curioſity of mankind have been at laſt clearly aſcertained: the cauſes of the tides of the ſea were long an enigma, and ſcarcely any man now doubts the ſolution which Newton has given. We know nothing of the nature of any one kind of material action, excepting by its operations upon other kinds; and it may alſo be found not to be impoſſible to diſcover the nature of mind by its operations upon matter, and upon other minds. In order to obtain juſt views of the ſyſtem of nature, we muſt both inveſtigate the different parts ſeparately and unite them together, before we can view it as a great whole. We muſt riſe from particulars to generals, and from a collection of all the facts draw general reſults. It was by tracing the power of attraction in every particle of matter, and examining the laws of falling bodies, that Newton was enabled to infer the gravitation of the planets and the laws of their motion. In like manner we can only determine whether mind be or be not a ſeparate exiſtence, by examining whether its action and character correſpond with the action and character of matter. From this conſideration it is evident that phyſics muſt always be joined with metaphyſics, before we can expect a ſucceſsful iſſue of the inquiry.

Moſt of the principles contained in the following chapters, as well as thoſe of ſome others which are intended to follow, were the reſult of the author's ſtudies long before he had any intention of ſubmitting them to the public. He conceives that they will be found to be the unavoidable deductions of reaſon, which muſt be drawn from thoſe facts which an improved ſyſtem of phyſics has eſtabliſhed. His great object in publiſhing them is to correct thoſe errors which could only have been formed in the darker ages, before that ſcience [illegible] cannot be formed [illegible] must have a tendency to prevent the [illegible] of those principles [illegible] of the human [illegible] investigation [illegible]

In the [illegible] the author is [illegible] idea. It is [illegible] mind which [illegible] view of the [illegible] investigate the natural [illegible] other impulses connected with them. [illegible] work is great [illegible] Nothing [illegible] principles. [illegible]

The ſubjects here treated of are placed in the inverſe order in which they were written. The chapter on Free Will was compoſed before the author had any deſign of publiſhing. Mr. Godwin's Inquiry concerning Political Juſtice had for ſome time before engaged public attention; and the opinion of that author on the ſubject of neceſſity had accidentally drawn him into a diſpute with an acquaintance, which was purſued to a conſiderable length. Conceiving he had the advantage of his opponent, and being ſenſible that from the abſtract nature of the ſubject, the arguments would ſoon eſcape his memory, he took the fancy of ſetting them down in writing. The advantage he derived from this made him think of following the ſame plan upon ſome other ſubjects; and at length he formed the deſign of publiſhing the reſult of ſome of his ſpeculations.

In treating of Deity, the conſideration of accident, a ſubject that has been generally connected with Free Will, came in the way. This and ſome further knowledge of the Neceſſarian hypotheſis afterwards obtained from a friend who had adopted this principle, induced him to make ſome additions to the chapter on Free Will, in order to ſtrengthen the arguments which it contains. Excepting the ſtudy of anatomy, the chapter on Deity coſt him but little labour; becauſe it had for a long time before engaged his attention: but the chapter on Matter led him into inquiries he had never thought of; it obliged him to ſtudy ſeveral ſciences, and has retarded the publication of this volume much beyond his expectation. In the mean time Dr Paley's excellent tract upon natural theology having appeared, after the article Deity had been written, he was apprehenſive it would have ſuperſeded that chapter; but upon peruſing it he found, that, independant of the laſt ſection of that chapter, tho' the doctor had completely ſupplanted him ſo far as related to the direct evidences of the exiſtence of the Deity, there was ſtill one branch of the ſubject to which he and preceding writers, as far as the author has ſeen, have paid leſs attention, namely, an examination of the capacities and powers of matter as calculated to produce that order, and all that machinery and variety, which appear in nature's works without the direction of an intelligent being. He judged that ſtill there was room for his little chapter; but found it neceſſary to make conſiderable alterations. He therefore, in a great degree, cut off the anatomical part, referring to Dr Paley for complete ſatisfaction on that head; and ſomewhat enlarged that which treats of the powers and capacities of matter. This he was now enabled to do with more advantage, having ſtudied more fully the nature of matter.

There are two late works which have deſervedly acquired great celebrity; namely, Mr. Leſlie's Inquiry into the nature and propagation of Heat, and Mr. Drummond's Academical Queſtions. The principles of both theſe works are in ſome points directly oppoſed to thoſe of the author. The firſt of theſe having only come into his hands immediately before this volume was ſent to the preſs, to avoid the trouble of incorporating his obſervations upon it into the text, he annexed the note concerning the identity of light and heat, at the end of the chapter on Matter. The volume being nearly printed before he ſaw the other, his obſervations upon ſome of Mr. Drummond's opinions are inſerted, along with ſome other notes, at the end of the volume.

As the author never derived the advantage of what is called a liberal education the reader will not expect a diſplay of erudition or of elegant compoſition. Pretending only to the character of an humble inquirer, he has merely ſought perſpicuity and plainneſs. This is not only more conſonant to the taſte of one who always preferred the ſimplicity of Swift to the pompoſity of Burke, but is, in his opinion, better adapted to the nature of an argumentative ſubject. The ſtudy of the principles has always afforded him a high degree of pleaſure, but the compoſition and arrangement were to him ſerious labour, owing either to the want of that caſt of talents, or of that courſe of education, which were neceſſary to fit him for it. The long lapſes of time betwixt the writing of the different parts, the ſcanty portions of time he could devote to it, and theſe ſuffering frequent interruptions from his other avocations, muſt neceſſarily have occaſioned incongruities and inequalities of ſtile, for which he alſo pleads forbearance.

Perhaps it may be expected that he ſhould ſtate more particularly the ſubject of his future inquiries. This he is unable to do. In ſuch an extenſive field, he finds, that he may be obliged to inveſtigate ſubjects concerning which we have only very faint glimmerings of light, and to purſue unknown paths, which it may be very difficult to trace; it is therefore as impoſſible to lay down any preciſe plan, as to fix the period for the completion of his work: and as to this, if he were to judge of the future by the paſt, he can only indulge a very faint hope of being able to finiſh the taſk he has begun.

# PHYSICAL AND METAPHYSICAL INQUIRIES.

## CHAP. I.

## OF MATTER:

### SECT. I. *Of the Exiſtence of Matter*

THE human mind, along with the conſciouſneſs of its own exiſtence, is impreſſed with a belief of the reality of external objects. The parts of which any ſubſtance is compoſed are termed the *materials*, or *matter*; and hence the latter word has been employed to denote in general whatever is cogniſable by our ſenſes in the world around us. The mind, or faculty of perception, we feel to be diſtinct from the objects perceived; but as our knowledge of its eſſence is not determinable by extenſion, form, or any other quality of matter, we heſitate in applying to it the name of that ſubſtance with which our ſenſes are converſant. Mind, then, as exiſting in man, is diſtinguiſhed from matter. Its faculties of conſciousneſs, memory, reaſon, &c. are ſo different from any of the known qualities of matter, that there is no point of compariſon between them. It therefore has been generally ſuppoſed, that properties ſo incongruous muſt inhere in ſubſtances of different [illegible], and hence the mind of man has been diſtinguiſhed from his body, and denominated Soul, or Spirit. By analogy, a ſimilar being is believed to [illegible] each of thoſe maſſes of matter which [illegible] to be moved by a ſentient power; and [illegible] under the name of Spirit, Intelligence, Animation, Life, &c.—or ſometimes under the negative expreſſion Immaterial Subſtance.—another principle is conjoined with matter in the conſtitution of the world. Beyond theſe two, the imagination cannot go.

It is of matter only which we at this time profeſs to treat; and the ſubject preſents itſelf in three diviſions. 1ſt. Has matter, as our ſenſes repreſent it, a real exiſtence? 2dly, If it exiſt, is it dead and paſſive, without any determinate character, except what is impreſſed upon it by immaterial beings? Or, 3dly, Is matter alone, by its motion and modifications, ſufficient to account for all the phenomena of nature? Let us examine each of theſe in their order.

Though it will appear aſtoniſhing to moſt men that a doubt ſhould ever have been entertained concerning the reality of matter, yet it is well known that a philoſophical divine of the laſt century boldly undertook to prove its non-exiſtence. Such was the ſubtilty of his arguments, and ſo dexterouſly did he handle them, that not only his own adherents, but alſo ſome of thoſe who oppoſe his opinions, have pronounced them unanſwerable. It was however impoſſible that ſuch an hypotheſis could prevail over the direct evidence of the ſenſes. Nature (as Hume expreſſes it) muſt ever prevail over abſtract reaſoning. The controverſy is in a great degree forgotten, and it may be thought unneceſſary to revive it; but as I do not conceive that the root of his error has been fully laid open, I think it requiſite, in treating upon the ſubject of matter, to remove the rubbiſh which he has heaped upon it.

Miſerable and hopeleſs would the ſtate of man be, if he were by the very conſtitution of his mind conſigned to everlaſting error and deluſion in the firſt principles of human knowledge. If the foundation be bad, the whole ſuperſtructure muſt be inſecure. If you take away matter and its properties, what will be left behind? Nothing that we can diſcover, but the fleeting ſhadows of imagination, which will on all occaſions elude our graſp; we ſhall perceive nothing before us but a chaſm, a dark wilderneſs, which if we attempt to penetrate, we ſhall ſhare the fate of the benighted traveller, who by purſuing a will-o'-the-wiſp, lands in the marſh, inſtead of finding a comfortable houſe and a place of ſafety. If we reject matter, upon what are we to employ our minds, or how ſhall we collect ideas? The whole principles of ſcience and all the arts are founded upon the properties of matter. The chemiſt, the mathematician, the phyſician, the farmer, and the mechanic, derive all their knowledge by inveſtigating the powers and relations of matter; even the moraliſt and the divine explain their ideas and illuſtrate their doctrines by means of material things. If we therefore deny the exiſtence of matter, ſcience and art would be annihilated; all our ideas of beauty and proportion, figure and magnitude, number and variety, would be forever loſt; all our natural pleaſures would be deſtroyed; the paſſions themſelves would decay for want of nouriſhment; where then ſhould we be able to diſcover mind? We muſt inevitably land in nonentity, as Mr. Hume did by following up theſe principles.

Biſhop Berkeley, the author of this ſtrange theory, deceives himſelf and his followers by confounding ſenſation with the object which produces it, and with the idea ariſing from it. He ſets out by ſtating, that " it is an opinion ſtrangely prevailing among men, that houſes, mountains, rivers, " and in a word all ſenſible objects have an exiſt- " ence natural or real, diſtinct from their being " perceived by the underſtanding. But with " how great an aſſurance and acquieſcence ſoever " this principle may be entertained in the world, " yet whoever ſhall find in his heart to call it in " queſtion, may, if I miſtake not, perceive it to in- " volve a manifeſt contradiction. For what are the

" forementioned objects but the things we perceive " by ſenſe, and what do we percieve beſides our " own ideas or ſenſations? and is it not plainly re- " pugnant that any one of theſe or any combin- " ation of them ſhould exiſt unperceived?"

Every man who beſtows the leaſt conſideration upon the ſubject, will diſcover a very capital error in the anſwer to this query. There can be nothing more abſurd than to ſay that the thing we perceive is the ſame thing with the perception of it; this is as much as to ſay, that the cauſe is the ſame thing with the effect. In order to produce an idea ariſing from ſenſation, there must be a ſucceſſion of cauſes; 1ſt, the external object; 2dly, the ſenſation; and 3dly, the idea ariſing from the ſenſation. The diſtinction betwixt each of theſe will be obvious, when we conſider, that tho' we were poſſeſſed of the quickeſt ſenſes and the moſt acute mind, we never could obtain one ſenſation if there exiſted no external object. Again, though we were ſurrounded by ten thouſand objects, we never could obtain one idea concerning them without ſenſation. Hence it is plain that the external object is the cauſe of the ſenſation, and ſenſation the cauſe of the idea: the external object is without, but the ſenſation is within us. Senſation is generally inſtantaneous, at moſt but temporary; and it cannot be renewed without the preſence of the external object: but the idea often becomes permanent in the mind, or it may be renewed by the memory, without either the ſenſation or the preſence of the external object.

Theſe clear and obvious diſtinctions lead at once to the root of Berkeley's error: they enable us to detect the ſophistry of his reaſoning, and to diſengage our minds from that thraldom in which he has involved a ſubject, otherwiſe plain and perſpicuous. This mode of confounding one thing with another is carried through the whole of his reaſoning. His great aim ſeems to be to rob matter of all its properties, and then to laugh at us for purſuing an *ignis fatuus*. He denies that heat exiſts in fire, hardneſs in a ſtone, ſweetneſs in ſugar, &c. All these, according to him, are merely ideas or ſenſations, which he always links together, as if they were the ſame thing. But how does he perform theſe mighty ſtrokes of annihilation or transference? He gets rid of the material exiſtence of heat, by confounding it with the pain or pleaſure it occaſions, and then in triumph he pronounces it to be one ſimple idea. Whereas it is plain to every one, that heat is a real exiſtence, and pain and pleaſure are ſenſations, and not ideas at all. He gets quit of extenſion, by a compariſon of the different capacities of animals for perceiving it in bodies; and becauſe we cannot perceive a mite's foot, he denies that bodies poſſeſs it at all; although it is obvious that the idea of extenſion could be produced in no other way but by the extenſion which bodies poſſeſs. He denies ſolidity, becauſe bodies are poſſeſſed of different degrees of hardneſs and ſoftneſs, and becauſe the ſame object, by different degrees of compariſon, may be ſtiled either hard or ſoft; whereas it is evident that theſe different degrees cannot be produced, otherwiſe than by allowing the exiſtence of bodies poſſeſſed of different degrees of ſolidity. He endeavours to prove that ſweetneſs is not a property of body, by contending that the ſame ſubſtance which at other times is ſweet, will to a diſtempered palate appear bitter. This I deny. The ſame ſubſtance always retains the ſame ſweetneſs, be the man in ſickneſs or in health; and if he is capable of paſſing any judgment, he can at all times diſtinguiſh ſweetneſs and bitterneſs; but the difference to him is, that ſweetneſs which at other times was ſo pleaſant to his taſte is no longer agreeable to him. The qualities of the ſugar are the ſame, but his taſte is ſo changed that he has no longer any reliſh for it. In like manner a body at the temperature of 100° upon the thermometer, may produce an agreeable ſenſation; whereas at another time, a body at the temperature of 32° may be equally agreeable. But theſe differences betwixt our ſenſations do not deſtroy the exiſtence of all the degrees of heat betwixt 32 and 100; it only ſhews that our ſenſations are not fitted for being an accurate teſt, either of the exiſtence or the meaſure of the degrees of heat; and inſtead of ſupporting the theory of Berkeley, are direct proofs of its abſurdity.

One of his fundamental arguments is drawn from the nonreſemblance betwixt the qualities of matter and our ſenſations; and becauſe there is no reſemblance, he concludes, that material objects can have no exiſtence; "for (ſays he) though this "did exiſt, it is impoſſible for us to know it; be-"cauſe by ſenſe we know nothing beſides our own "ideas and ſenſations." I readily grant that there is no reſemblance betwixt our ſenſations and the material objects by which they are produced; and it is ſtrange that any ſect of philoſophers ſhould have conceived that there ought to be a reſemblance, as there is nothing in nature that could lead to it. There is no more reaſon to expect ſimilarity in this caſe than there is to believe their identity. Our ſenſations neither are nor can be like their cauſes; for no effect is like its cauſe, nor is it at all neceſſary that it ſhould be. It is ſufficient if it can be ſhown that there is a capacity and fitneſs in the one to produce the other. Thus although the prick of a pin is not like the ſenſation of pain, we can plainly underſtand that the capacity of a pin to tear aſunder the fibres of the fleſh muſt cauſe pain to a body that is ſuſceptible of feeling. It would not perhaps be a very difficult matter to aſſign a probable cauſe for moſt of our ſenſations, though in many caſes they are not ſo obvious as in this; but at preſent I ſhall defer the conſideration of what will more properly form the ſubject of examination in a future part of our inquiry.

Berkeley contends, "that though it were poſſi-" ble for matter to exiſt, it would be impoſſible "for us to know it; becauſe by ſenſe we know "nothing beſides our own ideas and ſenſations." Every man's experience will beſt decide this point, and to it I appeal. In ſeeing, hearing, taſting, ſmelling, and feeling, do not the ſenſes communicate the idea of a material object? Do we not feel the impreſſion of ſomething acting from without? do we not certainly know that it is not produced by any thing within? and does not every experiment we can make upon the ſubject confirm the fact? It is not confirmed by the evidence of one ſingle ſenſe only, but all the ſenſes declare the ſame thing, and often unite their teſtimony on the ſame ſubject. The apple which I feel ſolid and figured in my hand, appears coloured and figured to my eye; my noſtrils pronounce its odour, and my mouth its taſte. The fire which occaſions pain when I approach too near it, I perceive at the ſame time melting metals; and I am equally certain that the fire and the metals are material ſubſtances exiſting without me, as that pain is a ſenſation within me. It is thus that the materiality of objects of ſight are very often confirmed by the ſenſe of feeling, thoſe of taſte by ſmell; and even thoſe of hearing, although it is a more detached ſenſe, is alſo corroborated by ſome of the reſt. The ſound of my friend's voice is confirmed by the motion of his lips, and by the increaſed animation of his countenance. The ſound of a bell is corroborated by the ſtroke of the hammer, and the tremulous motion of its parts. It is ſo far from being true, as Berkeley aſſerts, that by ſenſe we perceive nothing beſides our own ſenſations and ideas, that except in caſes of great pain, or when we enjoy high degrees of pleaſure, we ſeldom if ever attend to the ſenſation itſelf. Our minds are ſo taken up with the external object, that they forget entirely what paſſes within. When I look upon an object, I never attend to my ſenſation of ſeeing it; nor, when I hear a ſound, do I ever think upon my ſenſation of hearing it. It is to the objects of ſight and ſound that all the attention is directed, and theſe are things exiſting entirely without me. Even in thoſe caſes when I direct my attention to the ſenſation, I find it impoſſible to ſtop there. The ſenſes are only the medium of communication betwixt the mind and the external object; and they cannot produce a ſingle idea, unleſs it is impreſſed upon them by external objects: we are therefore, from the very nature of the thing, obliged to look beyond the ſenſation to the object which produces it.

Berkeley appears to plume himſelf much upon this definition, as he two or three times repeats it, "That an idea can be like nothing but another idea." But if this is the caſe, why does he confound things that are in their nature perfectly different? Every man who examines his own mind will find his ideas are not at all reſemblances or patterns of his ſenſations. Our ideas are no more like our ſenſations, than our ſenſations are like the external object: there is therefore the greateſt abſurdity in confounding them. It is the character of the material object that is impreſſed upon our minds, and not the character of our ſenſations; and it is evident that the argument of Berkeley concerning ſimilarity operates againſt himſelf. When I take hold of a ſtone, I experience the ſenſation of hardneſs; and when I taſte ſugar, the ſenſation of ſweetneſs: but the property of hardneſs is not in my ſenſe of feeling, nor that of ſweetneſs in my ſenſe of taſte. My ſenſe of feeling is equally ſuſceptible of hardneſs and ſoftneſs; and my taſte, of ſweetneſs and ſourneſs; but they themſelves poſſeſs none of theſe qualities. My ſenſe of ſmell is capable of diſtinguiſhing a variety of odours, but is itſelf poſſeſſed of none: my ſenſe of ſight is capable of perceiving all the varieties of colours, but is itſelf poſſeſſed of none: my ſenſe of hearing is accuſtomed to many different ſounds, but is itſelf incapable of producing any. It is evident from theſe things that the ſenſes are not only capable of communicating varieties of the ſame, but even of oppoſite qualities. Now, to ſuppoſe that they either poſſeſs oppoſite qualities in themſelves, or that any one being or thing from whom they might receive them poſſeſſes them, is an abſurdity. No being or thing can be at the ſame time ſweet and ſour, or hard and ſoft; for though theſe qualities had been orginally imparted to any one being or thing, they muſt, according to a well known law of nature, have neutralized each other. The variety of matter only can produce the variety of ſenſations which we experience. The characters of our ideas are the characters of matter: there is not one ſingle ſenſation but what may by traced to its qualities; and it is impoſſible they can be any other thing, as nothing elſe can at all correſpond with them.

The good Biſhop, aware that the ſenſes themſelves are not poſſeſſed of theſe properties, directs us to the Deity and other ſpirits for the production of our ſenſations. I know it is the opinion of Dr Reid, the celebrated opponent of Berkeley, and many others who reject his hypotheſis, that all our ſenſations might have been produced, although matter had never exiſted, if the Diety had ſo pleased: but notwithſtanding ſuch authority, I cannot help thinking that this will be found a very raſh conclusion. There is no truth more ſelf evident than this, that no being can give what he does not poſſeſs; and if the Diety be immaterial, he cannot poſſeſs material properties, for this is impoſſible. Let any man try to conceive how a ſpirit could perſonify matter, or produce thoſe ſenſations which ariſe from material properties. How could a ſpirit impreſs the idea of figure and extent, when it is poſſeſſed of neither; or of length, breadth or thickneſs, when it is poſſeſſed of no demenſions, and conſequently incapable of being meaſured? How could it communicate the idea of number, when it is poſſeſſed of no variety of parts, but is one and indiviſible? or impreſs the idea of ſwiftneſs and ſlowneſs, when it is incapable of motion? Again, how could a ſpirit communicate ideas of roughneſs and ſmoothneſs, hardneſs, and ſoftneſs, when it is incapable of being ſelt; of colour, when it is incapable of being ſeen; or of ſound, taſte or ſmell, when it is not poſſeſſed of any ſuch qualities? It is evident to every one who duly conſiders theſe things, that no ſpirit could impreſs any ſuch characters upon our minds: ſuch a being not only wants the capacity, but the very idea of it is contrary to its nature. If it is abſurd to ſuppoſe any thing can give what it does not poſſeſs, it muſt be more ſo to ſuppoſe it can communicate properties which are the very oppoſite of its nature.

The properties of a ſpirit, as deſcribed by Berkeley and all other divines, are ſuch as muſt be totally indiſcoverable by any or all of our ſenſes. Senſation diſclaims all knowledge of ſpirit. It is as impoſſible for our ſenſes to diſcover any thing of ſpirit, as for a blind man to perceive colours. The Deity, as well as all other beings, always works by means; and as the ſenſes have been formed by him to be the only medium of communication with all external objects, our ideas muſt be derived from objects capable of making impreſſions upon them. We muſt therefore either renounce the idea of the Deity being a ſpirit, or, if we ſtill hold that opinion, we muſt ſuppoſe that he aſſumes material properties, before we can believe him to be the immediate cauſe of our ſenſations. But to ſuppoſe he always appears under a falſe character, is ſo derogatory to his honour, that I imagine the adherents of Berkeley will be glad to renounce the idea; and if they do, they muſt alſo renounce the opinion that our ſenſations are impreſſed upon our minds by any ſpirit.

It is evident from theſe conſiderations that we muſt look ſomewhere elſe than to the ſpirits which

Berkeley has conjured up for the cauſe of our ſenſations, and it will coſt us no great labour to diſcover them: we have only to turn our eyes to that matter which he would have excluded from the ſcale of exiſtence; we will find it again appearing with additional ſplendour, in ſpite of all his efforts; and that every feeling of the mind, as well as every nerve of the body, bear teſtimony to the truth of its exiſtence, and alſo to its being the true and efficient cauſe of all our ſenſations. By a very ſlight glance over material objects, we will find extenſion, figure, motion, impenetrability, and elaſticity; we will alſo find colours and ſounds, taſtes and ſmells, heat and cold, hardneſs and ſoftneſs, ſwiftneſs and ſlowneſs, number and variety; and in ſhort all the ideas which reach us from without; and it is not pretended by him that we have any that are innate. In moſt caſes the ſenſes lead us directly to the objects which cauſe them; and where this is not the caſe, experience ſoon directs us. How do we receive the ſenſation, and conſequently the idea of colour, but by the reflection of a particular kind of light; or of heat, but by the addition of a very ſubtle ſubſtance called by philoſophers caloric. In this caſe, the ſenſation correſponds exactly to the quantity communicated, and may be accurately meaſured. We again receive the ſenſation of cold in an exact proportion to the quantity abſtracted below the ordinary temperature. How do we feel theſe ſenſations of ſoftneſs and hardneſs, but by feeling whether or not the parts of bodies will yield to preſſure? How do we receive ideas of extenſion, but by carrying our eyes or hands along the ſurface of bodies; or of figure, but by carrying them round their extremities? and how do we receive ideas of motion, but by objects changing their places? Were it neceſſary, we might go through every ſenſation which we can receive, and they could all be traced to material action, and to nothing elſe. If we renounce matter, how incalculable would be the loſs! It is not only thoſe ideas which ariſe immediately from ſenſation, but alſo thoſe that are derived from them in a ſecondary manner that we ſhould be deprived of. All our ideas of compariſon, of number and variety, &c. muſt follow the reſt.

But we have not yet done with Berkeley. He is ever fruitful in reſources, and we muſt now purſue him through the regions of fancy in the ſame manner we have done through the land of ſpirits. He contends that what happens in dreams and frenzies is a proof that all our ſenſations may be produced without the action of material bodies. In order to have made the argument complete, the Biſhop ſhould have tried to prove, that all the ideas which we obtain in dreams and frenzies are produced by ſpirits; but there is no doubt he would readily perceive that to aſcribe all the wild and incoherent ſuggeſtions of a madman, and the inconſiſtencies of dreams to an intelligent ſpirit, would not ſound well. If dreams and frenzies were the produce of ſenſation, it would afford a ſtronger argument againſt material exiſtence than any thing Berkeley has advanced: but as the contrary is the fact, it cannot affect it in the ſmalleſt degree. The ideas produced by dreams and frenzies have no connection with ſenſation, but are ſolely the productions of imagination. The conceptions of mind, whether aſleep or awake, whether in a ſound or unſound ſtate, will not produce ſenſation. A man in the ravings of a dream or in a frenzy may conceive himſelf pierced with a ſword; but will this produce a wound, or the painful ſenſation which a wound produces? Here lies the difference betwixt the ideas of ſenſation and imagination: the one is produced by real exiſtence, and is itſelf poſſeſſed of real exiſtence; the other is only the child of imagination, and Berkeley may juſtly claſs them among his non-exiſtences. The one produces a change upon body, but the other is only a momentary impreſſion, which the next moment is no where to be found.

Every one knows that dreams proceed from impreſſions made upon the mind when awake; and frenzy or inſanity often ariſes from ſome unfortunate circumſtance in life. When this is not the caſe, it will be found to proceed from a hereditary or acquired diſeaſe exiſting in the animal frame, which, like all other diſorders, may be removed by that which eradicates the diſeaſe, and improves the conſtitution of the body.

Theſe facts prove, that mind is by no means independent of material influence, and conſequently afford a deciſive proof of the exiſtence of matter; as it is certain that that which does not exiſt can neither kill nor cure. Dreams and frenzies are proofs of the weakneſs of mind, but afford no evidence of its independance of matter. Nothing can more clearly prove this, than that it cannot proceed one ſtep beyond the bounds of material exiſtence. It cannot form to itſelf an idea of a new kind of matter, a new colour, a new ſound, or a new taſte or ſmell entirely different from what it has already known to exiſt; neither can it conceive the idea of a thing tangible that is not poſſeſſed of any of the degrees of hardneſs or ſoftneſs, roughneſs or ſmoothneſs, heat or cold, or any of the properties which the ſenſe of feeling enables us to perceive. All that mind can do is to combine and arrange thoſe exiſtences and properties already known: it cannot produce one thing new; we may in imagination join the head of an ox and the tail of a fiſh, to the body of a camel; we may try to combine the bellowing of the bull to the warbling of the linnet, and to vary the connections of things already known; but this is not creating a new kind of matter, or giving a new ſenſe; this is entirely beyond our conception. Mind ſeems to have the greateſt power in the variation of forms of any thing known: yet even in this reſpect it is limited by thoſe general arrangements already exiſting in nature. All the forms we can conceive muſt either be allied to the ſquare or the circle, or comprehended under the ideas of length, breadth, and thickneſs: we can conceive nothing that is not diſtinguiſhed by theſe properties. It is therefore evident that our minds are in every reſpect limited by material exiſtence, and that without it we ſhould never have been able to form a ſingle idea.

It is not difficult to account for the operations of mind in dreams and frenzies. The mind has the power of renewing, modifying, and arranging ideas acquired by former ſenſations, ſo far as memory enables it to command them. This power is called imagination, and forms an exception to all the other faculties of mind, by being ſubjected to perpetual activity or reſtleſſneſs.

Whatever this reſtleſs activity ariſes from, it may be conſidered as the ſpring of action, as will be ſhewn when we come to examine the faculties of mind. It is capable of collecting and diſpoſing of every ſort of materials according to its own pleaſure, and the range in which it wanders is equal to the capacity of mind. If the mind be ſound, and the other faculties in an active ſtate, its wanderings are confined within the bounds of probability, and the arrangements it forms are carried on with ſome degree of regularity and conſiſtency; on the other hand, when the other powers are in a dormant ſtate, its action is called dreaming; when the mind is itſelf diſordered, its action is called frenzy or madneſs. At theſe periods, the ideas it collects are for the moſt part without form and void, like the chaos of earth before it was arranged by the hand of intelligence; and if action ariſes from it, it is of that wild and irregular caſt which is deſtructive to itſelf and dangerous to others. When the mind is reſtored to a ſtate of ſoundneſs or activity, we are at no loſs to diſtinguiſh the ſpurious iſſue of imagination from the legitimate children of ſenſation. I cannot help ſmiling when I think of the exact ſimilitude there is between the Biſhop's theory and the proofs he brings to ſupport it. The ſpirits he employs to produce ſenſation are equally as unfit for the taſk, as perſons in a dream, or during a paroxyſm of madneſs, are to produce the higheſt performances of intellect.

I have judged it altogether unneceſſary to examine the queſtion which Dr. Reid conſiders as the foundation of Berkeley's theory, whether we perceive objects by means of images of them in the mind; becauſe his hypotheſis can never be fairly drawn from the affirmative of that opinion, allowing it to be true. We can never have any image without an object; and if images of material things be formed in the mind, it can only be done through the intermedium of matter itſelf, as no object can produce an image different from itſelf. Berkeley has no more right to deny the exiſtence of material objects becauſe ſeen by an image, than he who perceives his own image in a glaſs has to deny his exiſtence. It is therefore plain that this opinion affords no foundation for the Berkleian theory, as Dr Reid ſuppoſes. But there is another opinion which he himſelf ſupports that has ſtill more miſled the Biſhop, and affords him his moſt ſpecious arguments.

He takes advantage of an arbitrary diſtinction concerning the qualities of matter, which has been very generally adopted by metaphyſicians. Mr. Locke, the chief ſupporter of this diſtinction, divides the qualities of bodies into *primary* and *ſecondary*. The primary he makes to conſiſt of Solidity, Extenſion, Figure, Motion, and Reſt. The ſecondary he determines to be Colours, Sounds, Taſtes, and Smells: "All which (ſays he) "are nothing in the bodies themſelves, but powers "to produce the various ſenſations in us by theſe "primary qualities; and ariſe ſolely from the bulk,

“ figure, texture, and motion of the parts of the
“ bodies.”

I can by no means approve of the diviſion here made. It is undeniable, that the ſame collection of matter which to-day forms a hard and impenetrable maſs, may to-morrow be ſoft and liquid, and the next day gaſeous; and in this ſtate we loſe all perception of its ſolidity, extenſion, and figure. It appears evident from this conſideration, that though theſe properties are the diſtinguiſhing qualities of groſs and bulky bodies, they are the moſt remote and imperceptible properties of the original particles of matter. I grant that the original particles are really poſſeſſed of figure and magnitude, becauſe if theſe were not originally inherent in them, it is not poſſible that they could be acquired; but it appears ſomewhat odd to call thoſe primary qualities which are only temporary and changeable ſo far as they are perceptible to ſenſe. And if you apply them to the original particles, it ſeems extremely paradoxical to aſcribe ſolidity to that which cannot be felt, and extenſion to that which cannot be ſeen. It is as impoſſible to diſcover theſe properties in the particles of matter, as in any thing which can be conceived under the name of ſoul or ſpirit, or in any thing whatever. Theſe are ſo much beyond the reach of our perception, that though our ſight is aſſiſted by the magnifying powers of the microſcope, we are unable to diſcover either the figure or the magnitude of theſe inſcrutable atoms. So far are theſe from being the only primary properties, that they are perhaps the very laſt which we are able to diſcover. If matter had not originally been poſſeſſed of adheſive powers, it never could have united in ſuch maſſes as to become viſible to us. Adheſion, therefore, is one primary quality, beſides extenſion, figure, and mobility.

We know nothing of the figure and magnitude of the particles of the magnetic and electric fluids, or of the particles of light and caloric; these are forever unknown to us; but we are fully acquainted with their exiſtence, their powers, and their effects. Theſe are equally inſeparable from the particles; and as they are much nearer to the ſtate of their original exiſtence, when they make themſelves known to us, they ought to have the chief rank as primary qualities. In ſhort, though we cannot deny figure and magnitude to be primary properties, yet by examining the original character of matter and the phenomena of nature, we ſhall find it much more difficult to aſcertain their claim than that of the reſt; and were it not for the abſtract conſideration already mentioned, we ſhould be ready to doubt their right altogether.

*Solidity* is a phraſe of great ambiguity; it is merely a relative term; and if we apply it to bodies of ſuch magnitude as are perceptible to ſenſe, it conveys no preciſe idea, as in fact there is nothing that is abſolutely ſolid. If it were ſo, it would be beyond the power of art or even of nature to deſtroy its texture, or to change its properties. We can purſue the particles of matter no further than they enter into the gaſeous ſtate; and the particles of gaſeous bodies ſeem to us very remote from the idea of ſolidity, in as much as they are all elaſtic, ſo far as my knowledge of them extends; and this appears to be the caſe with moſt kinds of matter found in an uncombined ſtate: there is at leaſt every reaſon to think that it is ſo with light and caloric, two bodies that are never found in a ſtate of ſolidity by themſelves, and perhaps the leaſt ſuſceptible of it by combination of any other kinds of matter. Heat is not only capable of being expanded, but has alſo the capacity of expanding other bodies. Light alſo poſſeſſes an expanſive power in a high degree; as it is well known that the quantity which iſſues from a lighted candle will fill all the ſpace within two miles of it every way, before the candle has loſt any ſenſible part of its ſubſtance. A quantity of light ſufficient to fill a large ſpace will paſs thro' a pin hole: this not only ſhews that its particles are minute beyond our perception, but alſo beyond our conception. Independent of this, we are led to inquire, whether this correſponds with the idea of figure, magnitude, and ſolidity. How can that ſubſtance which one moment will paſs through a pin hole, and the next fill a large ſpace, have any determinate figure or magnitude, or yet poſſeſs ſolidity? Theſe characters ſeem altogether inconſiſtent; and it would be impoſſible to reconcile them, if matter had no other primary qualities than thoſe allowed by Mr. Locke. We are therefore led to another primary property not yet mentioned, viz. repulſion. By this power each particle is ſeparated ſo as to fill a larger ſpace; and by it alſo it ſeems to multiply itſelf by its refractions and reflections.

It is worthy of remark, that all thoſe properties of matter which Mr. Locke conſidered as ſecondary qualities, produce the moſt diſtinct and forcible ſenſations; that light ſhould produce the moſt diſtinct viſion, that air ſhould produce ſound, and other kinds of matter ſo many diſtinct taſtes and ſmells, and yet that none ſhould give the perception of what is conſidered to be their univerſal primary properties. Fire, or the higheſt degrees of heat, give the moſt piercing ſenſations, beyond the power of human nature to endure, but it does not produce the ſmalleſt ſenſation of ſolidity.

If the particles of matter are poſſeſſed of ſolidity, they muſt alſo be hard, becauſe being indiviſible they are incapable of that ſhifting of parts which conſtitutes ſoftneſs ; and if they be poſſeſſed of hardneſs, we might in many caſes expect to feel their force. There is a direct application of the particles of matter in the operations of many of the ſenſes. Thus in ſeeing, there is a direct application of the particles of light ; in hearing, of the particles of air ; and in ſmelling, of the particles or effluvia of bodies. Now, this is not always an application of individual particles which may be ſuppoſed to be ſo ſmall as to be imperceptible. There is in the perception of white bodies a mixture or combination of all the ſeven kinds of rays of light, thrown upon the eye with a velocity equal to 200,000 miles in a ſecond. If the particles of matter were hard, they might be expected, when thus united and magnified, to produce the ſenſation of hardneſs, particulary in viſion, as the eye is the moſt delicate part of the body, and an immenſe quantity of rays are poured in with a velocity which we ſhould ſuppoſe not only ſufficient to deſtroy the texture of the eye, but to penetrate the whole head, if they were poſſeſſed of any degree of hardneſs or ſolidity. If we look at a very bright object our eyes ſhall be dazzled, or if we look up to the ſun we ſhall feel an uneaſy ſenſation, but not that of hardneſs.

If doubts can be entertained concerning the propriety of ranking ſolidity among the primary properties of matter, there is ſtill much more reaſon for ſcepticiſm in conſidering the pretenſions of motion and reſt to ſuch a high character. It is ſurely "of all abſurdities the moſt abſurd" to aſcribe to any thing one quality and the very oppoſite of that quality alſo. If motion be a primary property of matter, it muſt be reſtleſs: If reſt be a primary property, it muſt be motionleſs. The matter is not at all mended by converting the term into mobility. Who doubts that it is capable of being moved? It is alſo capable of being touched or taſted; but what is this to the purpoſe? Unleſs matter ſimply conſidered, both in the aggregate and in the minuteſt particle as an uncompounded ſubſtance, poſſeſs the power of moving itſelf without the action of any other ſubſtance, you can never determine it to be a primary quality of matter.

It is evident from the conſiderations which have been ſtated, that figure, magnitude, ſolidity, and mobility, ſo far from being the only primary properties of matter, are the very laſt that come to be diſcovered in the original particles; and we are induced to place them in the firſt rank, rather by a proceſs of reaſoning than by the direct evidence of the ſenſes. They are indeed the moſt prominent features in all bodies, but were it not for the power of adheſion, no being poſſeſſed of ſenſes like ours could ever have known that ſuch proper-

[illegible] which it is applied? A [illegible] makes all things appear [illegible] are ſeen through a yellow co- [illegible] The compoſition of the eye is [illegible] and therefore muſt neceſſarily [illegible] thing of the ſame colour, in the [illegible] as a pair of green ſpectacles makes every [illegible] green. Theſe facts and many o- [illegible] admit of no ſolution, but on the principle [illegible] colour is inherent in light; and by this view [illegible] the ſubject every appearance may be ſatisfacto- [illegible] explained. They prove that colour is not a ſecondary quality, but an orginal exiſtence; for though you may call it a ſecondary quality of bodies, it is a primary quality of light.

It is not neceſſary for my inquiry, nor ſhall I pretend to determine how far configuration or denſity may affect colour, by favouring the tranſmiſſion of one kind of rays more than another. I am convinced, however, that the permanent changes which take place in the colour of bodies are chiefly occaſioned by the abſtraction or addition of ſubſtance, rather than by mere change of configuration and denſity. The cauſe of wax and cloth becoming white when bleached (an argument made uſe of by Mr. Locke) is owing to their being deprived of the colouring matter, rather than to any change of texture; or, in other words, it is owing to their being deprived of that part of their ſubſtance which has a tendency to reflect a particular kind of rays in preference to all others; whereas the remaining parts have the capacity of reflecting all kinds of rays equally. On the other hand, when colour is communicated to bodies, it is performed by the addition of a ſubſtance which has a tendency to reflect a particular kind of rays only.

Locke ſtates a fact which it is ſtrange did not lead him to conclude that colour is in the light, even ſuppoſing him unacquainted with Newton's experiments when he wrote the Eſſay on the Human Underſtanding. He ſays, that porphyry is deprived of its red and white colours when the ſun's rays are prevented from falling upon it: but upon their return theſe colours reappear. Nothing could operate more ſtrongly againſt the truth of his hypotheſis than this ſimple fact. The porphyry's being placed either in the ſun or ſhade can never produce a change upon its configuration or denſity, nor yet can it produce a change upon the mind of the beholder; its loſs of colour is evidently owing to its want of certain kinds of light, and to no other cauſe. If Locke was inexcuſable in overlooking the obvious concluſion of ſo plain a fact, it is ſtill more aſtoniſhing that Newton himſelf ſeems afraid to draw the inference his experiments ſo fully warrant. After deſcribing the experiments in the moſt perſpicuous manner he adds; “ If at any time I ſpeak of light and rays as “ coloured or endowed with colours, I would be “ underſtood not to ſpeak philoſophically and properly, but groſsly, and according to ſuch conceptions as people would be apt to frame from ſeeing “ theſe experiments; for the rays, to ſpeak properly, are not coloured: in them there is nothing elſe than a certain power and diſpoſition “ to ſtir up a ſenſation of this or that colour.” This declaration on the part of a man who has been juſtly ſtiled the prince of philoſophers, affords a ſtriking proof that the ableſt of men may be deceived by the prejudice of education and the influence of authority; and ſhews the danger of placing implicit reliance upon any one man or ſect of men. Can it really be conſidered ſpeaking improperly to aſcribe to light thoſe qualities which his experiments ſo fully warrant? Or is it unphiloſophical to draw an inevitable concluſion from unequivocal facts? Is it to be rejected becauſe it clearly explains the whole phenomena of colours without any myſtery or reference to an unknown cauſe? There never was an opinion more unfounded than this, that colour is a mere ſenſation. Colour is an object of ſight; and ſight, like all our other ſenſes, can only diſcover that which is material, as it knows nothing of immateriality. If colour really exiſted in the mind it could never require the action of material objects, nor the aſſiſtance of the ſenſes to produce it. The mind never requires foreign aid to perceive what is within itſelf: this is evident from the exerciſe of memory and imagination, the line of demarcation is plainly drawn betwixt them; it knows nothing from without, but by the aſſiſtance of the ſenſes, and it knows nothing within itſelf, except by its own powers.

2. *Sound* ariſes from the action of air upon body. Air is eſſential to its production. It appears from experiments made with a bell in the air pump, that ſound can no more be produced without air, than colour without light; and it alſo acts as a medium of communication betwixt our ears and the ſounding body. It has a peculiar effect in aſſiſting the propagation and influencing the continuation of ſound, as we find that when air is obliged to circulate in hollow caverns, or ſtrikes againſt perpendicular rocks, it is propagated by repeated echoes, and acquires a lengthened exiſtence. There are two modes of propagating ſound; 1ſt, by exciting vibrations in the parts of the ſounding body, as is done by ſtriking a bell, a drum, or a muſical ſtring; 2d, by confining the action of air ſet in motion within the hollow cavities of bodies, as in the caſe of the flute, and other inſtruments by which ſound of that kind is produced, without the vibrations of body. It is manifeſt from this laſt mode of producing ſound, that it neither

conſiſts in vibration, nor in any peculiar kind of motion exiſting in the ſounding body; for in the experiment of the bell in the air pump we have vibrations without ſound, and in the caſe of the flute, we have ſound without the vibrations of the ſounding body.

Although ſound cannot be produced except when air is ſet in motion, yet, on the other hand, the motion of air itſelf will not produce it. Motion here, as in all other caſes, is only the means whereby the powers of matter work. The moſt forcible blowing of the mouth gives no ſound without the action of tongue. The moſt violent gales which take place in the upper regions of the atmoſphere, or even on the level plain where there is nothing to obſtruct its progreſs, and drive it back in vibrations, produces little or no ſound; but when rocks or mountains, houſes or trees retard its progreſs, or when it acts upon the ſoft and yielding fluid of water, and thus produces vibrations, then ſound is propagated in proportion to the force of the colliſion, and the extent of the boundaries it is obliged to retrace.

Theſe facts render it manifeſt, that neither the vibrations of what is called the ſounding body, nor the mere motion of air is the cauſe of ſound, it muſt therefore either be a property of the ſounding body, or of air, or of ſomething that is combined with them, and which is ſeparated by the colliſion of body. It cannot be a property of the ſounding bodies, becauſe their capacity of ſound is not owing to the inherent powers of matter of which they are compoſed, but to their accidental properties of form, elaſticity, or denſity; and it would be abſurd to ſuppoſe that accidental qualities are the cauſe of any real exiſtence in nature. Moreover, as theſe bodies are compoſed of a great variety of diſtinct materials very different in their nature, it would be contrary to the whole analogy of nature to ſuppoſe that they are all equally poſſeſſed of it. Every thing leads us to conceive that it muſt be inherent in ſome one particular kind of matter, in the ſame way as colour is inherent in light. It cannot be a property of the atmoſphere, becauſe in this caſe the mere motion of air would produce it: neither does the motion of the atmoſphere at all correſpond to the motion of ſound; becauſe the motion of ſound is equally ſwift, whether it proceeds from the mouth of a cannon, or is produced by the gentle ſtroke of a muſical ſtring: but the motion of air always correſponds to the force of impulſe, which, in one of the caſes adduced, muſt be infinitely greater than in the other. The motion of ſound is generally found to be about thirteen miles in a minute; whereas the motion of air is often ſlower than a man can walk.

As ſound is neither a property of the ſounding body, nor of atmoſpherical air as a body, it neceſſarily follows, that it muſt be a property of ſom of the component parts of either the one or the other, which is ſeparated by the colliſion betwix them. Independent of the argument drawn from the great number of materials of which ſounding bodies are compoſed, as already ſtated, it is evident that if it were derived from any one of the component parts of the ſounding body, it muſt neceſſarily exhauſt itſelf by frequent uſe, as every inſtrument, like a veſſel filled with water, could only give all that it contained. But this is not the caſe with ſounding bodies: a bell will continue to ſound for many centuries, nay, as *long* as it is kept free from injury; and you may play perpetually upon the ſmalleſt muſical inſtrument without the leaſt diminution of its power of ſound. As neither the bell nor the muſical inſtrument loſe any of their properties by continual uſe, it is evident that the ſound cannot ariſe from any of the component parts of the ſounding body which are ſeparated by colliſion. We are therefore obliged to apply to ſome of the component parts of air, or of ſomething that is always intermixed with it, as the cauſe of ſound.

I will not pretend to determine which of the component parts of air, or any other fluid intermixed with it, is the cauſe of ſound: perhaps this is altogether indiſcoverable. We are, however, certain, that it does not ariſe from electricity, or any other of thoſe extremely ſubtle fluids which are found capable of penetrating the air pump. Were it ſo, the bell would have ſounded in the experiment above mentioned. If a ſeries of experiments were inſtituted on purpoſe, and all the component parts of atmoſpherical air, and other fluids generally incorporated with it, ſeparately conveyed into an exhauſted receiver which contained a bell, perhaps the principle of ſound might be diſcovered; but although it ſhould not, I apprehend that its material origin is ſufficiently apparent. Whoever conſiders the manner of its production will readily perceive that it never can be conſidered as a mere ſenſation of mind. As already obſerved, it is produced by the colliſion of air and body; and it is capable of being prolonged ſo long as the action is continued. The agents employed are material; the nature of the action is ſuch as matter only can produce. In ſhort the whole proceſs is as repugnant to the idea of immateriality as any thing can be. Let any man try to conceive how that which is immaterial could perſonify the colliſion of one body with another; let him attempt to account for the agency of form in prolonging and regulating this action, and he will find it impoſſible. On the other hand, the whole proceſs is perfectly conſonant to the nature of material action. It is communicated to us by means of bodily organs. The man who is deaf to the colliſion of body, and the action of air, is utterly incapable of obtaining the perception of ſound, however perfect the powers of his mind may otherwiſe be. It is regulated by mechanical laws, in the ſame manner as any other kind of material action is regulated. Its velocity and intenſity have been meaſured, and found to be as regular as the law of gravitation, the motion of light, or of any body whatever; nay, its very deceptions, as they are called, like thoſe of viſion, point out its material origin, and determine its character; as it can eaſily be ſhewn that the form and ſituation of the material bodies are the cauſes of this deception. It is not only a material exiſtence, in oppoſition to the opinion of Berkeley, but it is a primary quality, in oppoſition to that of Locke. It is not indeed a primary quality of the ſounding body, but it is evidently ſo of ſome of the component parts of air, or of ſomething intermixed with it.

There is a ſtriking ſimilarity betwixt colours and ſounds, both in their origin and mode of action. Colours are produced by the action of light upon body, and ſounds by the action of air upon body; light produces no colour without the agency of body to ſeparate its parts, and air produces no ſound without the ſame agency to ſeparate its parts. Again, colours are reflected, and form images of themſelves; and ſounds are reflected, and form echoes of themſelves. There is moreover a rivalſhip eſtabliſhed betwixt them, who ſhall rank higheſt in the eſtimation, or have moſt power over intellectual beings. There is a peculiar excellence in their operations ſuperior to all the other material powers: colour is deſtined to be the ornament, and ſound the delight of nature. With ſo ſtriking a ſimilarity in their nature and character, we are conſtrained to place them in the ſame claſs of exiſtence; and as colour is found to be a primary quality of light, we are led to determine ſound to be a primary quality of ſome other active fluid.

3. *Taſtes* and *ſmells* are ſo ſimilar in their nature that it would be quite ſuperfluous to beſtow upon them a ſeparate conſideration: neither is it neceſſary for my purpoſe to enter into any particular inquiry concerning them. Taſtes ariſe from the ſubſtance of bodies taken into the mouth, ſmells from the effluvia of bodies communicated to the noſtrils: and there is ſome reaſon to think, that they prove either good or bad, agreeable or diſagreeable, according to their affinity or repugnance to unite or combine with the humours of the body. This, however, muſt be determined by experiment. The ſenſes of touch, ſight, and hearing, are our appointed guardians againſt all external injuries: for the ſame purpoſe, taſte and ſmell are ſtationed like centinels to guard the en-

colliſion of body, and, the a and the internal
incapable of obtaining th us inquiry to exa-
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wiſe be. It is regula does not begin its oper-
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any body our exiſtence. Our ſenſe of feel-
they ar the dagger when it ſtabs, or the fire
mate rns us; and in like manner it cannot
car d that our taſte and ſmell reject that
r would immediately injure or deſtroy us.
ns this is not ſo obvious, as it sometimes
ens that the ſame ſubſtance which at one
we are fond of is at another time very diſagreeable: thus any thing that is ſweet is very often nauſeous in a period of ſickneſs, although in general it is agreeable to us; and a perſon in a full habit of body will loathe the rich meat which in a lean ſtate he greedily ſought after. But theſe conſiderations conſtitute no exception to the principle; they rather confirm it; as in the circumſtances in which they are rejected, they would be injurious to the body. It may be conſidered an objection, that although arſenic and ſome other poiſons are not nauſeous to the taſte, they are equally deſtructive as either the fire or the ſword. I have ſeen it ſomewhere ſtated, that arſenic is

til it is mixed in the ſtomach with
; and that then the mixture be-
terious, and conſequently the
to throw it off. If this is the
all contradict the idea of repug-
uſe the ſenſes bear no prophetic cha-
ey only ſpeak what they feel, and this
always do with faithfulneſs and accuracy,
though they do not foreſee conſequences.

Taſte and ſmell not only guard againſt what is hurtful, but they act as powerful ſtimuli in aſſiſting the appetite. They go hand in hand in exciting the ſupply neceſſary for the ſupport of the body. In like manner we love to perceive a beautiful object, to hear a melodious ſound, or to feel a ſmooth body; becauſe theſe are in their nature, not only harmleſs, but ſalutary and beneficial in a much higher degree than we are apt to perceive.

It is impoſſible to doubt the material origin of taſtes and ſmells, as they can have no relation to any thing elſe than body. How can that which is immaterial produce taſte, when it is neither poſſeſſed of taſte nor flavour? How can it produce ſmell when it gives out no effluvia? It is the qualities and varieties of body alone that can produce all the varieties of taſte. Ideas can no more ariſe out of nothing, than our exiſtence. If Berkeley had been called upon to ſhew how taſte and ſmell could be produced by a ſpirit, it would have puzzled all his ingenuity, and laid open the abſurdity of his ſyſtem. But he covers the weakneſs of his cauſe by ranking taſte and ſmell, after Locke, among the ſecondary qualities of body.

This opinion is equally unfounded as the other; for it is impoſſible that taſte and ſmell can be derived from figure, or any of thoſe called the firſt qualities of body. Taſtes diſcover neither form nor texture; and they cannot depend on theſe, as form and texture are always deſtroyed either by previous preparation or by the teeth, before we are ſenſible of its taſte. Again, as to ſmells, theſe are communicated by particles that have broken off all connection with the form and texture of the bodies from which they are derived: it is therefore abſurd to ſuppoſe that ſmell has its dependence upon that which has no exiſtence. The ſubſtance of bodies alone is the cauſe of taſte and ſmell: acids will always be ſour, and alkalis acrid and pungent, whether adminiſtered in a ſolid or fluid ſtate. If it be the ſame ſubſtance, and no part of it loſt, it will always have the ſame qualities. The example of the bruiſed almond, ſtated by Locke, is no proof of the contrary; the change of its taſte and colour, after being bruiſed, is owing to its loſs of ſubſtance, and not to the change of its form and texture; for this muſt have been done in the mouth, though it had not been bruiſed before. All vegetables collect a conſiderable quantity of their ſubſtance from the finer fluids of the atmoſphere; and it is obvious, that on the deſtruction of their veſſels by the peſtle, a part of theſe will be ſuffered to eſcape, and thus cauſe a loſs of ſubſtance, and conſequently of taſte.

The ſenſe of feeling is aſſociated with that of ſight and of hearing, as another guardian againſt all external injuries. It is diſtinguiſhed, like ſight, by its connection with one of the moſt powerful agents in nature; and maintains an excluſive communication with heat, in the ſame way as the eye does with light. It acquaints us with the properties of hardneſs and ſoftneſs, of roughneſs and ſmoothneſs; and, in common with ſight, it judges of figure, magnitude, and diſtance. Theſe ſimilarities are ſtriking; and they appear more ſo when we conſider, that with the exception of heat and light, they are nearly confined to the ſame objects and to the ſame ſtate of body. Objects which are viſible are in general tangible; on the other hand, when an object becomes imperceptible to touch on account of its minuteneſs, it has alſo reached the borders of inviſibility. Thus all ſolids and liquids are perceptible to both ſenſes; whereas the gaſes are found to be beyond the reach of their powers. I am aware, that the atmoſphere, when agitated, becomes ſenſible to our feelings, though not to our ſight; and that, on the other hand, vapours are ſometimes viſible before they are tangible: but theſe exceptions ſcarcely deſerve to be noticed, as in general the boundaries are found to be much the ſame, unleſs the ſight is aſſiſted by the microſcope. When this is the caſe, it deſcends as far below the ſenſe of feeling, as it riſes above it in point of magnitude and diſtance.

The ſenſe of feeling comprehends within the range of its powers all thoſe properties generally termed primary qualities of body; and as theſe are conſidered ſo very oppoſite in their nature to the idea of immateriality, Berkeley has not dared to attack them in front, but only aims a ſide blow at them through the medium of the ſecondary qualities. Having, as he conceives, deſtroyed the materiality of colours, ſounds, taſtes, and ſmells, by the aſſiſtance of Mr. Locke, he requires us to abſtract extenſion, figure, and ſolidity from theſe; and then breaks off in triumph, becauſe this is impoſſible. The triumph is vain---the materiality of thoſe called ſecondary qualities is again revived; their connection with the primary qualities, of courſe, ſo far from deſtroying their materiality, tends powerfully to ſtrengthen it.

We have now diſcuſſed the ſubject of primary and ſecondary qualities, and have ſhewn, that if colours, ſounds, taſtes, and ſmells may be called ſecondary qualities of bodies, they muſt be conſidered as primary properties of ſome of the kinds of original matter, and not mere ſenſations. When theſe qualities (the grand pillars of the non-material ſcheme, of which Berkeley was the apoſtle) are reſtored to their original rank, the unſupported fabric falls to the ground. So bold an attack upon the evidence of ſenſe, and thoſe impreſſions which are moſt deeply engraven upon the underſtanding, is unparalelled; and it is perhaps equally aſtoniſhing that it ſhould have attracted ſo high a degree of public attention. It muſt, however be obſerved, that Berkeley had previouſly paved the way for the reception of his doctrines, by his ingenious tract intitled A new Theory of Viſion. In this work he attempts to weaken the evidence of ſenſe, by denying that we have the original perception of figure, magnitude, and diſtance by the ſenſe of ſight.

Figure and magnitude being the moſt unequivocal of thoſe properties ſuppoſed to be primary, he no doubt conſidered them as the moſt powerful opponents of his theory. He therefore attempted to deſtroy the double evidence of ſight and touch which appears in their favour, and, like a cunning pleader, having diſcredited the teſtimony of one witneſs, concludes that the other would be conſidered as an inſufficient proof law. He denies that we have originally the knowledge of any thing but colour by the ſenſe of ſight, and contends that theſe things are only perceivable by the ſenſe of touch or feeling; and that when we judge of figure and magnitude by ſight, it is from different ſenſations felt in the eye, which experience and habit have taught us to be the conſequence of viewing objects of different figures and magnitudes at different diſtances. The ſenſes are too valuable ſervants to be diſcarded as unfit for their taſk. It would be highly dangerous for us to ſuffer any of their primitive rights to be attacked. I therefore embrace the opportunity of controverting this opinion, and of vindicating the power of the eye to the original perception of figure, magnitude, and diſtance. This appears the more neceſſary as Berkeley's opinion has been too generally adopted, and ſo far as I have been able to learn, has never been controverted.

I differ ſo very widely from the Biſhop upon this ſubject, that I apprehend figure, magnitude, and diſtance, are more immediately perceivable by the ſight than by the touch; as it very often happens that an object touches us or we touch it, without our perceiving either its figure or magnitude: whereas it is utterly impoſſible to caſt our eyes on an object without our immediately perceiving both. The qualities immediately perceivable by the touch are heat and cold, and ſome degrees of hardneſs and ſoftneſs, roughneſs and ſmoothneſs. I ſay ſome degrees of theſe, for I ſuppoſe it very poſſible for a body to touch us ſo very ſlightly, that though we ſenſibly feel it, we cannot diſtinguiſh whether it is hard or ſoft, rough or ſmooth. You may, for inſtance, draw a bit of very fine wire ſo very lightly along the back of the hand or any other part of the body that you cannot diſtinguiſh the touch of the wire from that of a hair, except by the difference of the temperature; and if both were raiſed to the heat of the blood, it would not be at all diſtinguiſhable. But paſſing this: no man can ſay that figure or magnitude is immediately perceivable; for to obtain a knowledge of theſe properties, examination and trial are requiſite. Let any man blindfolded be placed among a number of objects altogether unknown to him, and of which he has never ſeen the like, he cannot immediately, on touching them, determine either their figure or magnitude. He muſt carry his hands round their extremities, and over their whole ſurfaces, before he can ſay what is their figure, or ſo much as gueſs at their magnitude. It is aſtoniſhing any man ſhould conceive that we have an immediate perception of diſtance by touch. Diſtance and touch are contradictory terms: they are two oppoſites, which, ſo far from being immediately connected, cannot exiſt together. [illegible] is impoſſible that touch ſhould give us the [illegible]mediate perception of diſtance, for though [illegible] ſhould ſuppoſe it to mean only that diſtance which is within arms length, this cannot be known but by meaſurement. It is only by ſtretching out the arm that we obtain any knowledge of diſtance by this ſenſe, for tho' an object touch us in any part of the body, it gives us no perception of diſtance; and if we are blindfolded, though an object touch at arms length, we do not know how near it may be; we only touch it in one point, and we know not but it may be within a hair's breadth of us in ſome other. We muſt feel over its whole ſurface, examine its length, breadth, and thickneſs, before we can determine this point by feeling. Again, ſuppoſing we touch one object with one hand and another object with the other, we do not know whether this is the ſame or a different object, until we bring our hands together, nor yet can we ſay how far they are ſeparated, until we carry our hands to their extremities. Now this is the very reverſe of immediate perception. It is evident from theſe few ſimple obſervations, that our knowledge of figure and magnitude is not immediate, but acquired by examination and trial.

But though it were granted that the knowledge which we obtain of figure, magnitude, and diſtance by touch were immediate, it could never be the foundation of that which we obtain by ſight; 1ſt, becauſe they differ in their moſt eſſential characters; 2dly, becauſe the perception of theſe properties by touch is far inferior to thoſe of ſight in point of accuracy and quickneſs, and the ſphere of its action can give no idea of the range of our viſual faculty.

1. The perception of figure, magnitude, and diſtance, by touch, is very different in its moſt eſſential characters from that which we obtain by ſight. What are the moſt ſtriking features of figures? They conſiſt in beauty or uglineſs, in proportion or diſproportion, and in their uniformity or diſagreement with the ſurrounding objects. A blind man can form no idea of theſe things, notwithſtanding all the helps he derives from thoſe who ſee; far leſs could we, if we had been deprived of thoſe helps, as we muſt neceſſarily have been without their original perception by ſight. A blind man can diſtinguiſh a triangle from a ſquare, and in ſome caſes an oval from a circle; but he never can diſcover that ſuperior beauty and delicate lightneſs which diſtinguiſhes the oval from the circle, and the oblong from the ſquare. If he cannot perceive properties of this nature in ſingle figures, he can ſtill leſs diſcover it in the more complex. He cannot diſcover the beauty which the

prominent angle forms by contraſt with the retiring concave by means of light and ſhade. A pla and ſmooth ſurface will always appear more agreeable to the ſenſe of feeling than the carved capital, or the notched cornice, and the ſoft downy pillow than the fluted column. Proportion is utterly indiſcoverable by the ſenſe of feeling, becauſe its powers can never ſeize the whole parts of a figure at one graſp, ſo as to perceive the relation in which proportion conſiſts. Proportion conſiſts neither in the ſtraight nor in the curved line, in the angled corner nor the circular bend, but in that ſymmetry or relation which ſubſiſts betwixt the whole parts of a body; in the fitneſs of their aſſociations, in the harmony of their various parts. Theſe things we can never obtain by touch; and if it be altogether incapable of taking in the ideas of proportion, it can ſtill leſs acquire thoſe which ariſe from the connection and ſituation of the ſurrounding bodies, as theſe require greater powers of combination. No man poſſeſſed of the ſenſe of ſight is ignorant how much the appearance of things is altered by the ſituation they are placed in, and by the nature of the bodies which ſurround them: he can perceive the beauty of a landſcape where wild nature alone prevails, but more particularly where both nature and art combine to form agreeable varieties. The blind man would rack his invention in vain to form ideas of thoſe contraſts and beauties which ſuch landſcapes preſent. He may indeed learn the language of deſcription, but he might as well pretend to diſcover colours as thoſe beauties which the ſituation and connection of different bodies preſent.

Again, the ſenſe of touch can never give us thoſe ideas of magnitude which are derived from ſight. A blind man can have no perception of the awe which the view of a majeſtic object creates, nor of the dread and terror occaſioned by looking down from the brink of a precipice. The effects of remote diſtance are equally unknown to him. The extent of the horizon, and the proſpect of the riſing ſun, produce ſenſations of a much higher nature than any he ever conceived; and if he cannot obtain ſuch perceptions, it is equally impoſſible that we could from the ſenſe of touch.

2. The perceptions of touch are far inferior to thoſe of ſight in point of accuracy and quickneſs, and the ſphere of its action can give no idea of the range of our viſual faculty. In many caſes it will be found very difficult to diſtinguiſh by feeling an elipſis from a circle, and an oblong from a ſquare, if the figures are large; and if they were very complicated, we ſhould find it altogether impoſſible to diſtinguiſh what we can eaſily do by ſight. A ſingle glance of the eye will perceive

that which could coſt the hand a world of labour to diſcover by the touch. The knowledge we have of figure by ſight is pretty accurate in a caſes where the object is fully preſented to view. We can diſtinguiſh one ſimple figure from another, as readily as one colour from another; and if there are certain caſes in which the ſame figure preſents a different appearance to the eye, it is no more a proof that it has no immediate perception of figure than the different colours which the ſame body puts on at different times and circumſtances, are a proof that we have no immediate perception of colour. In all caſes where the viſible appearance of objects differs from the real, it does not ariſe from any imperfection in the powers of the eye, but from the numerous refractions and reflections which light ſuffers in its approach, and from the variety of media thro' which it paſſes. The vaſt expanſe in which the eye ranges, and the variety of media through which it penetrates, operate ſo variouſly upon light, that it muſt unavoidably produce different appearances; but theſe variations rather eſtabliſh the regularity by which the eye acts, than prove its incapacity for diſcovering theſe properties of body. The knowledge we have of figure by the eye appears to be pre-eminent to every thing elſe. It is far ſuperior in extent of diſtance to thoſe limits within which we can diſtinguiſh colours, although theſe are held bour Berkeley as its only original perceptions. It extends to vaſt diſtances, and to the moſt remote proſpects. We can readily determine the figure of the ſun and moon, with all the variety of phaſes which the latter puts on. Such are its wonderful powers, that it can diſcover figure through water, glaſs, and other tranſparent bodies, where all our other ſenſes are excluded. Shall we then believe that ſuch a power is obtained at ſecond hand, or that its impreſſions are communicated merely by the means of another ſenſe which is far inferior to it?

Our knowledge of magnitude and diſtance by ſight is no leſs real than that of figure, but it is much more limited in point of extent and accuracy. The incalculably minute gradations into which magnitude and diſtance are diſtinguiſhable, render it impoſſible to determine them, with any degree of accuracy, even in moderate ſpaces; and when we lift our eyes to the celeſtial bodies, we ſeem to loſe all knowledge of magnitude and diſtance. The ſun appears neither larger nor more diſtant than the moon, and the whole heavenly bodies appear to be placed upon one vaſt concave ſurface. It muſt therefore be acknowledged, that we have no pretenſions to an exact knowledge of magnitude and diſtance. We neither poſſeſs this originally, nor do we acquire it by habit: it has uniformly the ſame appearance from the period of our firſt recollection to the end of our days. It is therefore evident, that habit makes no change nor any improvement upon it. I only contend, that we have an original perception of the *reality* of magnitude and diſtance, though not of their meaſurable amount. I readily concede to Berkeley, that all our caculations concerning the proportions of magnitude and diſtance are derived from experience and habit, but not the original power of perceiving when an object is very near or not. It is eaſy to determine what is original and what is acquired. The one is perfect, and always certain; the other is imperfect, and always uncertain. Our perceptions of the reality of magnitude and diſtance are always perfect, but our knowledge of their proportions is imperfect. We know moſt certainly that an object poſſeſſes magnitude, and when it is leſs or more diſtant, but we can pretend to no meaſured accuracy.

This imperfection in reſpect of meaſured accuracy does not degrade the faculty of ſight below that of feeling, as by this ſenſe we cannot decide either upon exact magnitude or diſtance. In all the confined magnitudes and diſtances within the power of touch, the eye can determine with more accuracy and quickneſs than the hand without meaſurement. It is plain, therefore, that no preriod [illegible]ions can be ſet up from this imperfection that [illegible] viſual perceptions are derived from thoſe of touch: This imperfection of our knowledge of magnitude and diſtance does not ariſe from any incapacity of the eye, but from the nature of things, and from the different quantities of light which reach the eye at different diſtances. In the ſame circumſtances, the eye always preſents the ſame reſult with perfect accuracy. In ſhort diſtances, the light flows with ſuch abundance as to make every part of an object viſible; but in thoſe that are remote the rays are too much diſperſed before they reach the eye to give diſtinctneſs to the different parts; they therefore preſent a different appearance, and are much leſs accurate; but in all this, there is neither a defect in the powers of the eye, nor any uncertainty in the laws of viſion.

We are now to examine Berkeley's ſeocond poſition, viz. That when we judge of figure, magnitude, and diſtance by ſight, it is from different ſenſations felt in the eye, which experience has taught us to be the conſequence of viewing objects of different figures and magnitudes at different diſtances. If Berkeley had admitted, that the eye has an original perception of figure and magnitude, I could readily conceive that theſe properties would affect us differently at different diſtances; but as we are not permitted to believe that the eye has the perception of the properties, the ſuppoſition of their agency in affecting the feelings of the eye, is beyond my conception. You can never have action without the exiſtence of an agent; and if you deſtroy the agent you alſo unavoidably deſtroy the action. How can figure and magnitude impreſs the eye with the idea of diſtance, if it has not the power of perceiving it? Do we acquire our knowledge of figure and magnitude firſt by the habit of feeling, and do theſe again produce ideas of diſtance by their habit of action? According to this doctrine, one habit will produce another, and by and by we ſhall be altogether compoſed of habits, excepting one root or ſtamen for the reſt to grow out of. Thus we have no occaſion for more than one original power. However plauſible this theory may appear, I confeſs myſelf ſo much enraptured with Lady Nature, that I can never permit her brighteſt ornaments to be given away to her rival Habit. I deny Dame Habit's claim, and contend that the eye by its natural power has the perception of figure, magnitude, and diſtance.

It is admitted by all parties that we are in poſſeſſion of the power of perceiving theſe properties, and the only object of diſpute is how we acquire that power. Is it by Habit? I anſwer, no---habit never beſtows a new power; the utmoſt it can perform is to improve thoſe we are already in poſſeſſion of, and to teach us to make uſe of them with more dexterity. The man who has a defect in his eye, or in any other part of the body, can never cure it by the habit of uſing it. A change muſt be produced in the ſtate of the organ, elſe the defect will always remain. No doubt can be entertained that the capacity of the eye for judging of figure, magnitude, and diſtance, is much improved by habit and experience: but in order to improve it, there muſt be a capacity of improvement. The capacity of no animal is acquired by habit. You might as well attempt to impreſs a ſtone with the charms of muſic, as to affect the eye with figure, magnitude, and diſtance, if it had no original perception of theſe properties.

I agree with Berkeley that we never calculate diſtance by the bigneſs of the angle made by the meeting of the two optic axes, or that we never think of the greater or leſs divergency of the rays which fall upon the pupil. We have no occaſion to calculate theſe angles to diſcover the reality of diſtance, becauſe this is not a matter of calculation, but of immediate perception. It is only when we attempt to judge of the amount of diſtance that we have any occaſion to calculate, and there are other data by which we can form our opinions more readily than by the calculation of theſe angles. But it is unneceſſary for me to enter upon this ſubject, as it has been largely handled by Dr. Reid and others.

It muſt be acknowledged, that the idea of diſtance is not immediately connected with body: it is an accidental circumſtance, and not an inherent property, like figure and magnitude; but this by no means proves that we have no original perception of it. Colour is no more an inherent property of body than diſtance, yet Berkeley admits that we have an original perception of colour. The caſe of Cheſelden's patient has been conſidered a deciſive proof that we have no original perception of diſtance. But this is by no means obvious. The young man, before he was cured of the cataract, had always been accuſtomed to judge of objects by the touch. It was therefore a very natural prepoſſeſſion in him to ſuppoſe that every thing touched his eyes in viſion, in the ſame way as they touched his hands by handling them; but this deception laſted only until he had learned to give that direction to his eye which is neceſſary to obtain a diſtinct view of objects. It is admitted, that he ſaw every thing very confuſedly, and much too large. This plainly indicates that he had not that command over his eyes which is neceſſary to obtain diſtinct viſion. It is alſo admitted, that he had the perception of magnitude; and if he had, the perception of diſtance is neceſſarily included in it; as, however large the object may be, the eye could only touch it in one place, conſequently every other muſt appear diſtant.

The account of this caſe is too conciſe, and the experiments are too few, to warrant the concluſion which has been drawn from them. But notwithſtanding this, the only particular fact related concerning him proves clearly, that he had the perception of diſtance. He could not by the eye at firſt diſtinguiſh the cat from the dog, until he one day laid hold of the cat, and examined it by the touch. It is plain from this fact that he had the perception of diſtance when he laid hold of the cat; and it is impoſſible at that period he could have learned the habit of determining that diſtance by means of pretended feelings in the eye. He was then only beginning to make compariſons, but had not acquired the habit; he muſt therefore have perceived the animal's diſtance by the inherent powers of the eye.

I readily grant, that infants make no uſe of their eyes for ſome time after they are born. This is not owing to the want of power, but to the want of practice. The eye is not ſingular in this reſpect, as every other ſenſe requires time to improve itſelf for action, as well as this. The new born infant can no more make uſe of his hands or his feet than his eyes. He can no more diſtinguiſh one ſound or one taſte from another, than one object from another. It requires time to enable the child to judge of hardneſs and ſoftneſs, of roughneſs and ſmoothneſs, as well as of figure, magnitude, and diſtance. So far are the perceptions of ſight from being derived from feeling, that they go before it in all the acts that are common to both of them. It is only after the infant has learned to diſtinguiſh objects by ſight that he attempts to handle them; and the many uſeleſs attempts he makes before he can perform it, prove that his powers of viſion are put in practice before he has acquired the habit of judging by touch. Long after he has learned to diſtinguiſh figure, magnitude, and diſtance, by the eye, he will take hold of the edge of a razor as ſoon as a cryſtal bobbin, and catch at the flame of a candle as ſoon as a bit of ſugar. Is it reaſonable to ſuppoſe, that what is only a ſecondary proceſs, and acquired by the aſſiſtance of another ſenſe, ſhould be learned before that which ariſes from immediate perception?

Let us now examine thoſe ſuppoſed feelings in the eye, that are ſaid to confer ſo many wonderful powers. It might have been expected that Berkeley, before he attempted to build ſuch a theory, would firſt have proved the connection of theſe feelings with the fluid of light. I muſt acknowledge I have ſome doubts whether light be not as imperceptible to the ſenſe of feeling as heat is to the ſenſe of ſight. Every philoſopher knows that when heat is totally ſeparated from light, it is not perceptible to the eye, nor to any other ſenſe, except that of feeling. We alſo know, that though taſte and ſmell are the two ſenſes moſt nearly allied, and though the properties which are perceptible to both are frequently united in the ſame body, yet we never diſcover the taſte by the ſmell, nor the ſmell by the taſte. Theſe facts give ſome reaſon to ſuppoſe, that the author of our being has ſet boundaries to the different ſenſes, by which they can never be confounded together, and that the action of the one can never ſuperſede the action of the other. If thoſe particular properties of matter which act upon the ſenſes were poſſeſſed of the power of operating upon every part of the body, there would be no uſe for diſtinct members, ſolely appropriated and fitted for the purpoſe; but it is one very diſtinguiſhing branch of animal economy, that theſe members are fitted for that particular action, and for no other. There is not only an adaptitude in the conſtruction of the organ favourable to this action, but there is reaſon to ſuppoſe an affinity betwixt the fluid that acts and the organical ſubſtance acted upon, which gives the ſenſes the higheſt degree of power derivable from matter. I am aware, that we are ſenſibly affected with pain in the eye when we attempt to look upon the full blaze of the ſun's light, and that many injuries have been ſuſtained by injudiciouſly perſevering in ſuch attempts, which ſeems to indicate, that light ſenſibly and powerfully acts upon our ſenſe of feeling. It muſt, however, be obſerved, that the ſun's light is always accompanied with a very conſiderable degree of heat, and there is ſome reaſon to ſuppoſe, that it is the heat and not the light that is offenſive and injurious to the eye. Perhaps this might be proved by experiment. The ingenious Dr. Herſchel has found, that the violet rays, on account of their great refrangibility, contain only a ſmall portion of heat. If a concentrated pencil of theſe rays were thrown upon the eye, without affecting it with any diſagreeable feeling, it would go a great way to prove the truth of my ſuggeſtion. But if it were poſſible to find a bundle of nerves of nearly equal ſenſibility in any other part of the body, and if theſe rays were thrown upon a blindfolded perſon when he was not aware, the experiment would be deciſive; becauſe, in this caſe, it would not be poſſible to confound the action of ſight with that of feeling. I throw out this conjecture rather as an object of phyſical inquiry than a ſupport to my argument; for, independent of this conſideration, I apprehend, that though we ſhould admit the exiſtence of theſe feelings, they are not at all calculated to give us any juſt ideas of figure, magnitude, and diſtance.

If it be by the ſenſe of feeling that we diſcover figure, magnitude, and diſtance in viſion, it muſt be either by the greater or the leſs impulſe with which the rays of light act upon the optic nerve; or it muſt be by the leſs or greater divergency of the rays proceeding from the extremities of the objects and acting upon the different points of the retina. I ſhall therefore examine each of theſe modes.

1. If our knowledge of the ſituation and properties of bodies is obtained by the leſs or greater degree of impulſe with which light acts upon the optic nerve, I cannot perceive how figure could be at all diſcovered; as an equal ſurface of body at the ſame diſtance, would always produce the ſame impulſe, whatever the figure be. It is therefore impoſſible to diſcover one figure from another by impulſe alone. Neither will it anſwer the purpoſe better for magnitude or diſtance. In judging of theſe properties by impulſe, we are obliged ro ſuppoſe, that a ſmall object will produce a weak and a large object a ſtrong impulſe, agreeable to the well known law of mechanical motion, that the larger the body the greater will be the impulſe, if the velocity be equal; on the other hand, a near object will produce a ſtrong, and a remote object a weak impulſe, if the velocity be equal. In conformity to theſe principles it must often happen, that a ſmall object at a ſhort diſtance will produce an impulſe equal to a large object at a remote diſtance; how then ſhall we diſtinguiſh the one from the other? It is evident that in no caſe

whatever can we be ſure that the diſtance does not diminiſh the magnitude, or the magnitude the diſtance. Again, a bright object, of the ſame magnitude and at the ſome diſtance will produce a greater impulſe than a dark one, and the ſame object, by being painted red, will appear of greater magnitude and at leſs diſtance than when it is painted black. All the ſeven colours will produce different magnitudes or diſtances, in proportion to their brightneſs or darkneſs; yea, without changing colour at all, an object will appear different in magnitude or diſtance by being ſeen in meridian ſunſhine and in twilight.

2. If it is by the leſs or greater divergency of the rays of light proceeding from the object and acting upon the retina, it will frequently happen that a ſmall object at a near diſtance will form the ſame angle with a large object at a more remote. This will take place in all caſes where the magnitude diminiſhes in proportion to the diſtance. According to this mode of judging, diſtance will deſtroy the effect of magnitude, and magnitude that of diſtance. The one will always be putting on the ſame appearances and forming the ſame angles as the other, ſo that it will be impoſſible to diſtinguiſh them. Even in caſes where the reſemblance is not exact, the different appearances will only be in proportion to the difference of the angles which they form to the eye, and not in pro-

portion to the real difference betwixt them. How then ſhall we determine what is magnitude and what is diſtance, ſeeing they are continually putting on the ſame appearances, and counterfeiting each other's character?

Nor will it much avail although we ſhould take both the modes of judging, and add the impulſe and the divergency together. It will not enable us to judge with more certainty, becauſe the impulſe is diminiſhed by diſtance as much as the divergency; and when this is the caſe, the one can never correct the defects of the other. If either of theſe modes had been correct at all diſtances, it might have ſerved to correct the miſtakes of the other, and thus become a ſtandard by which to judge: but as both are liable to the ſame uncertainty, there are no means by which theſe ſuppoſed feelings could give juſt ideas of figure, magnitude, and diſtance. They could never enable us to form the multiplicity of judgments, and all thoſe nice diſtinctions and compariſons we are conſtantly making at near diſtances, on many of which our ſafety from accidents ſo much depends. Every view we take of the ſubject, and every criterion by which we can examine it, tend to convince us that Berkeley's theory is unfounded. We may as well attempt to perform the operations of the head by the feet, as thoſe of ſight by means of feeling. The ſuppoſition of one ſenſe acting by the borrowed help of another is totally unſupported by any correſponding fact. It is both unnatural and dangerous, tending to create doubt and uncertainty as to things in which our belief is ſtrongeſt. It is calculated to produce ſcepticiſm about every thing whatever. It is only by the ſenſes that we have communication with external objects; it is on them as a foundation that all our knowledge reſts; and whatever ſhakes the foundation endangers the whole building. We cannot have the ſame confidence in our viſual perceptions, if we believe them to ariſe from mere habit and imperfect experience, as when we conſider them to be produced by the inherent powers of the eye. We never find that nature takes a circuitous route when a direct road can be found: we ought not therefore to interpret natural phenomena contrary to natural appearances, unleſs it can be proven that theſe cannot exiſt in the manner our impreſſions repreſent them. Nature never willingly deceives us. Every deluſive appearance neceſſarily ariſes from an obvious cauſe: they occur only in particular caſes, and theſe caſes can be clearly accounted for by the known laws of nature. Let us never be diſtruſtful without a cauſe: our ſenſes are our ſureſt guides. Whatever Berkeley's intentions were, and however great his abilities, he can never be conſidered as a friend to man. In his Theory of viſion, by denying the original capacity of the eye for thoſe perceptions it communicates, he leads us to diſtruſt the capacity of the ſenſes: In his Principles of human knowledge, he requires us to diſtruſt their unanimous teſtimony concerning the exiſtence of matter; and never did an author more flatly contradict his own principles than he does in theſe two works. In his treatiſe on Human Knowledge, he lays it down as a fundamental principle that we are utterly incapable of abſtraction, and that the qualities and modes of things are ſo blended together, that it is impoſſible for us to ſeparate them even in idea. But in contradiction to this principle, in his New Theory of Viſion he denies that by ſight we perceive any thing elſe but colour. I appeal to my readers, if it is not as impoſſible to conceive a body without figure and magnitude, as one without colour. I perfectly agree with him that it is impoſſible to frame the idea of body without ſome colour; but I contend that it is equally impoſſible to perceive colour, without having at the ſame time the perception of the figure and magnitude of the coloured body. The perception of colour is no more innate than that of figure and magnitude. We nowhere perceive colour, except in bodies poſſeſſed of theſe properties. If the perception of colour is neceſſarily connected with that of body, the perception of body is alſo neceſſarily connected with figure and magnitude; becauſe the one cannot be perceived without the other. It is therefore plain, that Berkeley, in attempting to ſeparate the perception of colour from that of figure and magnitude, has fallen into the moſt abſurd of all abſtractions, and that the principles by which he ſeeks to eſtabliſh his Theory of viſion are in direct contradiction to his Principles of human knowledge. I hope to be excuſed from any further purſuit of its vagaries: indeed I am afraid ſome of my readers will think I have dwelt too long upon Berkeley; but, independent of his celebrity, and the boaſt of his adherents that his arguments are unanſwerable, the inveſtigation has afforded me an opportunity of diſcuſſing ſome very important principles. I am particularly anxious to eſtabliſh juſt views concerning the original capacities of our nature, and to reſtore matter to its legitimate rank in the ſcale of exiſtence,---convinced that theſe points are eſſential to the ſucceſsful proſecution of our future inquiries.

The Biſhop's hypotheſis is not the only one we have to contend with in order to obtain juſt views concerning matter. A numerous ſect of metaphyſicians have long been in the habit of conſidering it as a dead and inert ſubſtance; and they deſcribe its whole properties to conſiſt merely in figure, magnitude, diviſibility, impenetrability, and mobility. Theſe opinions have been ſo generally adopted by metaphyſicians, that I am afraid of incurring the charge of preſumption by calling them in queſtion. But no authority can ſanction error; neither would it become the character of an inquirer to receive any opinions without examination.

It is well known that the experimental philoſopher never conſiders matter to be dead and inert; or that its properties conſiſt ſolely in figure, magnitude, and ſuch like: theſe he in a great degree overlooks, his principal ſtudy being to diſcover its other properties, powers, and relations, as it is by their means he carries on his operations, and regulates his ſtudies. In contemplating matter, he perceives a great variety of ſubſtances poſſeſſed of the moſt diſtinct properties and characters, which, ſo far from being dead and inert, have the capacity of acting and being acted upon, in various modes and by various powers. He finds all matter, in its original ſtate, compoſed of particles ſo minute as to defy the powers of our ſenſes to diſcover them. In this ſtate, they may appear to us to be annihilated; but ſo far is this from being the caſe, that they are then found to be the moſt active and powerful; their energies being diſengaged, they are more at liberty to act than when in a ſtate of combination. It is this ſtate of combination that makes matter appear magnitude: because the one cannot be per[illegible] [illegible] the other. It is therefore plain Berkeley [illegible] separate the pe[illegible] [illegible] of figure and magni[illegible] [illegible] all abstrac[illegible] [illegible] which he seeks to [illegible] direct cont[illegible] [illegible] knowledg[illegible] [illegible] farther purf[illegible] [illegible] of my [illegible] upon B[illegible] [illegible] of his celebrity, an[illegible] [illegible] his arguments a[illegible] [illegible] has afforded [illegible] of [illegible] some very impo[illegible] [illegible] I am particularly anxious to [illegible] the original ca[illegible] [illegible] matter to its [illegible] existence,—cor[illegible] [illegible] to the fu[illegible] [illegible] inquiries.

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dead and inert; becauſe its powers being already exerted, the particles are, as it were, held faſt in each others arms, and are thus prevented from any further action, until the diſſolution of their combination. Accordingly we find, that thoſe kinds of matter which are leaſt ſubjected to the power of coheſion or reduced to the ſolid ſtate are always poſſeſſed of the greateſt energy. It is among theſe that we find the moſt powerful agents in nature.

It has been diſcovered, that though moſt kinds of matter are capable of a great variety of combinations, they have in general certain predilictions (if they may be ſo termed), or capacities of uniting with ſome kinds in preference to others. In conſequence of theſe elections, and the active character of certain powers, innumerable changes are continually going on throughout the whole ſyſtem of nature. Beſides this capacity of forming elections, it has been found that all matter is capable of a peculiar kind of action called attraction, which the moſt minute particles, as well as the greateſt bodies, are exerting upon each other in every moment of time and through every part of ſpace. It is found that this is not confined to bodies collected in a maſs, but that the planetary bodies are continually exerting it upon each other. This influence forms a balance to that motion originally communicated to them, and thus preſerves them in their particular orbits.

There is no ſubject of inquiry more curious and intereſting than the variety of powers which matter poſſeſſes. There is not only a numerous variety of kinds, all of them poſſeſſed of different characters, but perhaps there is no one kind which is not poſſeſſed of a variety of powers. The power of attraction ſeems to be common to all matter; even that ſovereign power caloric, although it weakens the attraction and deſtroys the coheſion of other bodies, is not exempted from its influence, as will be afterwards ſhewn. The power of election, or chemical combination, is alſo inherent in all matter, unleſs caloric form an exception, its action being limited by no bounds, nor confined to any particular claſs of bodies. Beſides theſe more general powers, every particular kind of matter has diſtinct characters peculiar to itſelf, poſſeſſing qualities and producing effects totally different from all others. We muſt not ſuppoſe that light, heat, electricity, and magnetism, whoſe operations have attracted the notice of men in all ages, are the only active agents in nature; there are others, hitherto leſs distinguiſhed becauſe leſs known, which appear to poſſeſs greater variety of powers then any of theſe. Among the latter, oxygen holds a chief rank, a ſubſtance whoſe exiſt- is only a late diſcovery, becauſe it is never found it in a ſtate of combination or mixture. This wonderful gas is peculiarly diſtinguiſhed by the power of ſupporting animal life and combuſtion, as neither animals can live nor fire burn without it. It combines with hydrogen, and forms water; and with metals, and changes their characters and properties: it enters largely into the compoſition of animal and vegetable ſubſtances: it contains the principle of acidity, and beſtows that character upon a numerous variety of bodies. Theſe acids, again, that are formed by oxygen poſſeſs alſo a variety of powers, and hold a very diſtinguiſhed rank in animal and vegetable economy: they combine with earths and metallic oxyds, and change the character of theſe ſubſtances: they communicate ſourneſs to the taſte of animals, and impreſs that character upon a number of vegetables.

It would be vain to attempt an enumeration of all the varieties of powers that the different kinds of matter are already known to poſſeſs; and there is reaſon to think that much more remains to be diſcovered. One thing is very remarkable in the combination of the different kinds with one another, that the properties of a compound are generally very different from thoſe of its component parts. It ſeems to have loſt entirely the properties of the bodies of which it is compoſed, and to have acquired new ones which they did not poſſeſs. It is not a ſoftning down of each others qualities, ſuch as is produced by mere mixture; neither is it a ſimple addition of all the powers which the ſeparate parts are known to poſſeſs. It is a change of qualities altogether unlike the ſeparate parts; it is a union of powers, in many caſes much ſuperior to the ſum of all the parts taken ſeparately, as far as we can diſcover; and it can never be accounted for by any ſyſtem of mere neutralization. How are theſe things brought about? what becomes of the old properties; and how are the new ones acquired? It has by no means loſt the old properties; for on the diſſolution of the combination, they all again appear: neither could it bring forth new ones, if it had not previouſly poſſeſſed them; for nothing can give what it does not poſſeſs, nor can the ſum of the whole be greater than the ſum of all the parts. We can only account for theſe phenomena on the ſuppoſition that all matter poſſeſſes unknown properties, which only act in certain circumſtances, and conſequently never can be known but when theſe circumſtances take place; or that ſome kinds are ſo extremely ſubtle that they enter into all combinations without the poſſibility of being diſcovered, and at the ſame time are ſo very powerful as to overbalance the properties of the ſubſtances with which they combine. Whatever mode of ſolving theſe difficulties we adopt, it tends to prove, that the powers of matter far exceed our knowledge and comprehenſion; and that, independent of the proceſſes which paſs under the obſervation of our ſenſes, much unſeen work is performed, which we cannot diſcover except by the effects produced.

Whatever degree of intellectual power and ſkill may have been exerted in the firſt formation of the ſolar and planetary ſyſtems, it is manifeſt that the whole operations of nature are now carried on by means of the material powers. We everywhere perceive, that in conſequence of theſe powers being called into action, in innumerable proportions, and under a vaſt variety of circumſtances, every change is produced and every operation performed. By theſe powers, the vaſt planetary bodies are preſerved in their orbits: by theſe the ſyſtem of animation, growth and increaſe in animals and vegetables is maintained: by theſe the rocks & mountains are preſerved in a ſtate of ſolidity, and air and water in the fluid ſtate: by means of theſe powers, the thunder rolls, and the clouds pour down their contents; and by the ſame means water is changed into vapour, and vapour into gas, which is again condenſed and forms new clouds, thus maintaining a continual courſe of activity and motion. Nor is it only in the fluid atmoſphere or the watery deep that this activity prevails: even in the bowels of the apparently dead earth, and among the hard and impenetrable rocks, a courſe of change is going on, new bodies are forming, and old ones diſſolving. Beſide the more terrible operations of volcanoes, the more ſilent and ſlow proceſſes of cryſtallization, petrifaction, &c. are continually in action. In ſhort, when the vaſt power and continual action of matter is conſidered, no character can be leſs appropriate for its deſignation than its being dead and inert. I underſtand the word *dead* as here applied to ſignify, not merely the want of animal life, but a total incapacity of action : now, there is not one particle of matter which is not every moment exerting the power of action by attraction, adheſion, or ſome other mode. I underſtand *inertneſs* to mean the want of power, or an incapacity of motion : but no kind of matter wants power ; the moſt apparently ſluggiſh is capable of exerting a variety of powers ; and if the individual kinds do not poſſeſs the capacity of motion, they are collectively capable of it in all degrees, inſomuch that it is impoſſible for one kind to be within the reach of another power without exerting motion ; and it is by means of this neceſſary action that all the motion of the univerſe is maintained. I grant, that when we look upon the matter of the ſolid earth, it appears dead and inert ; and it certainly is not poſſeſſed of that ſort of action which we call animal life ; but that it is poſſeſſed of a different kind of life, the moſt ignorant are perſuaded. The farmer would never ſow his corn, nor the gardner plant his fruit, if they were not perſuaded that the earth was poſſeſſed of life, and that in conſequence their corn and fruits would grow and yield increaſe. It is indeed leſs active than animal life, but ſtill it is never without exertion. If all action were to ceaſe, the original atoms would inſtantly ſeparate and become imperceptible to all our ſenſes: all matter would appear to be annihilated, as it is by the action of matter that ſolidity as well as fluidity is preſerved.

It has been already obſerved, that the activity of matter is greateſt in its uncombined ſtate, becauſe its whole powers are then diſengaged and at liberty to act. It is only when its ſtrength has been previouſly exerted in the formation of body that it appears dead and inert. Thus the matter of a ſtone appears dead, becauſe the mutual action of the different particles are ſo balanced as to prevent further exertion; but that can never be conſidered dead, which is in a ſtate of conſtant action. Theſe atoms remain, as it were, priſoners in this ſtate, until they are releaſed by the ſuperior action of another kind; and when this is the caſe, their apparently dormant powers again appear. When matter appears inactive in a ſtate of combination, it is equally erroneous to determine it to be dead, as it would be to pronounce a man to be dead when he is found aſleep. However torpid and inactive the man is when aſleep, if you awake him he will rouſe to action. In like manner, the moment the materials of a ſtone are ſet at liberty from this ſtate of combination, their ſtrength returns, like Sampſon with his new hair, and their power and activity appear as great as ever. The gas which has for ſome thouſand years bound the hard and calcareous rock into a ſolid and inactive maſs, is found, at the diſſolution of the combinanation, carrying on fermentation and forming the vinous liquor, or communicating an active circulation and nouriſhment to vegetable bodies. The power which at one time cauſes the ſoft and gentle zephyr, at another time ſeems to lift the vaſt ocean from its bed; it produces the violent tornado and the terrible hurricane, which threaten dedeſtruction to the face of the globe. How unphiloſophical is it to call that which poſſeſſes ſuch wonderful powers, and is capable of ſuch aſtoniſhing exertions, dead and inert!

If the particles of matter which diſplay the leaſt apparent activity, cannot in any proper ſenſe be conſidered dead and inert, with what juſtice can it be applied to the more active and volatile parts of matter? What can be conſidered more active than heat or ſwifter than lightning? Conſider the variety of the powers and properties of light. This active fluid ſeems in ſome reſpects to form an exception to the general law of attraction. It is originally of foreign extraction, if we may ſo ſpeak;

and though it viſits the planetary worlds, it cannot be retained by them. It ſeems to be deſtined for the benefit of the whole univerſe, and conſequently travels over all. It ſets out from the body of the ſun with a velocity equal to the extent of its journey. It goes from planet to planet, from ſun to ſun, in other words, from ſtar to ſtar, diſtributing colours, illuminating and enlivening all nature. It never travels by circuitous routes, like the other great bodies which traverſe void ſpace, but paſſes on in ſtraight lines; and if it does not paſs through or combine with the bodies it meets, it is reflected back on other objects. When we think on its great power and grandeur, the delight it inſpires, and the extenſive bleſſings it diſtributes to all nature, there is leſs reaſon to be aſtoniſhed, that the ſuperſtitious notions in ancient time have made it an object of adoration, than that modern philoſophers ſhould have characteriſed it a dead and inert ſubſtance.

Let us now proceed to another ſect of metaphyſicians, of a caſt directly oppoſite to the former, who aſcribe ſo much to motion, as not only to give it the pre-eminence among the material powers, but alſo to ſet aſide the agency of the Deity altogether. It muſt be allowed that motion is the means, but it is not the principle of action. It is only an effect ariſing from a previous cauſe, and merely the mode by which nature commonly works; it ariſes ſolely from material action, and in all caſes it is entirely dependent on it. If the material action can be kept up by any plan of arrangement, ſuch as takes place in the ſolar ſyſtem, the motion may be made permanent; but if the material action has completed its impulſe, the motion ceaſes. It is vain, therefore, to reſort to motion as the ſpring of action, or to conſider it as a firſt cauſe.

In order to conſtitute motion an original power it muſt be proved to be inherent in all matter, or at leaſt in ſome one kind of it, to ſerve as a ſtimulus to the reſt. If motion were inherent in all matter, there could be nothing at reſt: but we find that a ſtate of reſt is as common in nature as a ſtate of motion: it is evident, therefore, that motion cannot be a property exiſting in all matter. Material action is no leſs real in a ſtate of reſt than in a ſtate of motion: it never ceaſes in the ſolid body, more than in the moving fluid: by this action its conſolidation is preſerved. It is ſo little dependent upon motion, that ſome changes (for inſtance, cryſtallization and fermentation) can be effected only in a ſtate of apparent reſt. If it be contended, that motion is inherent in ſome peculiar kind of matter, let that kind be pointed out; I confeſs myſelf unacquainted with it, It is only by the action of the ſun upon the planets that all that activity and motion which prevails among them is excited and maintained; and this is evidently produced by an arrangement and an original impulſe, which can never be accounted for by material action. In order to elucidate the ſubject, I obſerve, 1ſt, That there is no kind of matter which can direct the circumſtances of its own action, nor are any of theſe kinds poſſeſſed of an original and inherent power of action by itſelf. All material action is produced by a joint effort betwixt the different particles, and no one particle can act unleſs it is acted upon. This will be found to be univerſally the caſe. There is no combination that can change another, without being itſelf changed; and as every combination has a tendency to preſerve itſelf from change, it cannot be conſidered as the original cauſe of change. In order to effect a change, two or more of theſe powers muſt be, as it were, carried to the field, and ſet in battle array againſt each other; but they can neither ſeek to provoke a quarrel, nor march to find out the enemy. The magnet can no more go in ſearch of the iron, than the iron can go in ſearch of the magnet. They have neither of them power to move, until they are brought within the reach of each other's attraction; but when, by external circumſtances, they are brought within this line, their action muſt inſtantly commence. I grant that water may be ſaid to travel in ſearch of a level, but this takes place only in particular circumſtances, viz. when placed upon high ground. It is plain that every particle of matter is perfectly paſſive as to the circumſtances which produce its own action, and therefore can never be ſaid to be poſſeſſed of an original and inherent power of action by itſelf. I ſhall proceed to obſerve,

2dly, That the univerſal tendency of all material action is to produce a ſtate of reſt. Thus, the action of the power of gravity is to the earth's centre as a place of reſt: the action of water in ſeeking a level ariſes from the ſame cauſe: the action of fermentation is to produce a ſtate of reſt; and the action of caloric ariſes from a tendency to preſerve an equal meaſure of heat as a ſituation of reſt. In all caſes when the material action is completed, it falls into a ſtate of apparent reſt: the particles of matter have no more power to make motion perpetual than they have to begin it. When a combination is made, and a ſtate of reſt produced, the ſame powers can never looſen it. All the changes which take place in nature are produced by the alteration of circumſtances, and not by any directive capacity in the powers of matter. The powers of matter can no more produce the circumſtances, than the circumſtances can produce the powers; and when circumſtances preſent themſelves, their powers cannot ceaſe to act.

If motion be inherent in any kind of matter, I apprehend it will be aſſigned either to caloric or to light, becauſe the one is beyond doubt the moſt powerful, and the other the moſt active agent in nature. Let us therefore inquire into the nature of theſe wonderful powers, in order to diſcover whether either of them poſſeſſes an internal power of motion.

1ſt, Caloric, or the matter of heat, has obtained the notice of philoſophers in all ages as the prime agent by which a great part of the changes that take place in nature are brought about; and it has been obſerved, that whatever cauſes motion, alſo produces heat. The celebrated Lord Bacon, and ſome later philoſophers, have denied its material exiſtence, and contended, that the heat of bodies depends ſolely on the vibration of their particles. It ſeems at firſt view as impoſſible that the moſt powerful agent in nature ſhould be a nonexiſtent, as that the animal and vegetable ſyſtems ſhould have been framed without intelligence. This opinion, therefore, never obtained general aſſent; and as it has of late been deciſively contradicted by the experiments of Dr Herſchel, it is unneceſſary for me to enter upon it. I ſhall therefore conſider its materiality as completely eſtabliſhed, and proceed to examine what title it has to be ranked as a ſelf-moving power.

I preſume it will be allowed, that if caloric be poſſeſſed of no other ſource of action than what is common to the other material powers, it can have no title to be ſet up as a ſelf-moving power, or to be conſidered as the firſt cauſe of material action. What is the common ſource of material action? Attraction. It is general attraction that produces the circuitous motion of the planetary bodies, and preſerves them in their orbits. It is the particular attractions which are exerted betwixt the different kinds of matter, that produce all the variety of combinations, and all the action and motion which take place in the univerſe; yet we have ſeen all theſe ultimately tend to produce a ſtate of reſt. Is caloric an exception? Is it poſſeſſed of an inherent power of action and motion by itſelf, independent of all the reſt of the material powers? I anſwer, its action is only derived from attraction, and it has no other ſource of action different from the other material powers. The diſtribution of an equal temperature among bodies is one of the moſt ſtriking characters of caloric, and this can ariſe from no other cauſe than attraction. We have no other poſſible way of accounting for it; and its action cerreſponds ſo entirely with the character of attraction, as to admit of no doubt of its being the cauſe. When a quantity of caloric is accumulated in any body, all the ſurrounding bodies attract it, until it is ſo divided among them as to produce an equal temperature. What other cauſe can be aſſigned for this than attraction? It is impoſſible to conceive another power capable of producing it; and as attraction is the great principle of action prevalent throughout all nature, it would be abſurd to reject it in this caſe only. On this principle we can account for the great power of caloric over all other kinds of matter, without aſcribing it to any new principle, altogether different in its nature from that of any other material power. It is only more powerful than its fellows, becauſe its attractions are more general. It ſeems to have no elective attractions, but to have the capacity of combining with, or at leaſt of being attracted by all kinds of matter. Some bodies are capable of receiving a larger quantity than others, without undergoing a change, but they are all capable of receiving leſs or more, and the ultimate tendency of its action is to reſtore an equal temperature.

Some philoſophers deny that caloric is ſubject to the law of attraction, becauſe it is the great agent in diſſolving the attractions and combinations of other bodies; but it is more conformable to the general laws of nature to ſuppoſe, that its great power in diſſolving other combinations ariſes from its ſuperior attractions. It is well known to every chemiſt, that this takes place in many other caſes where caloric is not the agent. If you bring any kind of matter poſſeſſed of a ſuperior attraction to that by which a body is united, the firſt combination is diſſolved, and a new one produced. In the ſame manner caloric looſens the connection of other bodies by its ſuperior attractions: only there is this difference, that caloric has an attraction for all bodies, and is capable of being both diffuſed and combined. Its combinations, like all others, have a certain meaſure to which nothing can be added, and is called by its diſcoverer Latent heat; becauſe in that ſtate its property of heat is become inſenſible, but its diffuſion or mixture is limited to no meaſure: it may be added in ſuch quantities as to diſolve the whole body, and reduce all the particles into their primary ſtate.

I admit that caloric is not poſſeſſed of what is called homogeneous attraction; but this is no proof of its not being ſubject to this general law: on the contrary, there is ſome reaſon to think that thoſe bodies which are poſſeſſed of the ſtrongeſt homogeneous attraction have the weakeſt for other kinds of matter, and *vice verſa*. It is at leaſt known, that ſtrong adheſive powers render combination very difficult, even when the elective combination is ſtrong and durable. Caloric has no adheſive power: its action is never tied down by an affinity to its own kind, and it is poſſeſſed of a powerful attraction for all matter: it is alway sready to diſſolve the connection of other bodies. It is not therefore ſurprizing that it ſhould be ſignalized as the moſt powerful agent in nature.

The combination of caloric, I think, is clearly proved by this, that though all bodies have an unlimited attraction for it, yet the ſame quantity does not produce an equal temperature. This cannot be accounted for otherwiſe than on the ſuppoſition of combination, as it is the character of combination alone to change the properties of the combining matter. Combuſtion, and the converſion of ſolid bodies into fluids, and of fluids into vapour, afford the ſtrongeſt proofs of the combination of caloric. What is combuſtion, but the ejection of light and caloric by the combination of oxygen with a combuſtible baſis? It is the decompoſition of one body, of which theſe form a conſiderable part, and the formation of a new one from which they are in a great degree excluded. It makes no difference whether we conſider light and caloric as combined with the oxygen of the air or with the combuſtible body, or whether one of them is combined with the one and another with the other: it is ſtill a combination of which caloric forms a part, and from which it may in a great degree be excluded by a ſuperior affinity. In the former ſtate, it is evident, the properties of both heat and light are changed, becauſe they are not ſenſible: the one no more gives heat than the other gives light. But theſe properties are not loſt; for the moment they are ſet at liberty, they reappear. Again, the converſion of ſolids into fluids, and fluids into vapour, is evidently produced by the combination of caloric, as whenever that takes place, a quantity is abſorbed without affecting its temperature. In all theſe changes, it is evident that the heat abſorbed without affecting the temperature, muſt be either loſt or changed. That it is not loſt is evident; for, on the reconverſion of vapour into a ſtate of fluidity, or of fluids into the ſolid ſtate, the caloric is again given out in the very ſame proportion in which it was abſorbed. The change here produced is the true character of combination.

Thoſe who deny the attraction of caloric maintain, that its abſorption by liquefaction and vaporization can only be accounted for on the principle that the capacity of body is increaſed; but if by the increaſe of capacity is meant enlargement of bulk, the only ſenſe in which it can here be underſtood, it does not correſpond with known facts. Water occupies a leſs ſpace in the fluid than in the ſolid ſtate, and the contraction takes place juſt before it reaches the point of congelation. Its capacity or bulk has therefore been diminiſhed, rather than enlarged, as this theory neceſſarily ſuppoſes. It is argued, that we know no chemical combination in which the properties of one of the bodies combining are entirely loſt, while thoſe of the other are unaltered. I reply, that caloric appears to operate different ways in its action upon body. In the firſt caſe, it is merely diffuſed through the body, and not combined with it; conſequently it produces no change, but merely in temperature, and ſometimes in bulk. In the ſecond caſe, the caloric undergoes a change itſelf, without appearing to affect the properties of the body it acts upon: in this caſe it partakes of the nature of ſolution, in which the properties of the ſolvend are ſometimes changed, without appearing to affect the ſtate of the menſtruum. In the third caſe, a change is produced upon both bodies: their properties are entirely altered, and the combination is as perfect as any that exiſts in nature; ſuch are the changes from the ſolid to the fluid, and from the fluid to the gaſeous ſtate. It muſt be obſerved that in the firſt and ſecond caſes, the action appears to be of the ſame nature as in the laſt caſe, but the operation is not complete. The difference is in degree, not in kind, the quantity of caloric applied not being ſufficient to change the whole body; and our ſenſations are unable to follow the intermediate proceſs which is neceſſary to effect it: but this is common in moſt of the operations of nature. It may be ſuppoſed, that becauſe caloric is eaſily ſeparated, it has never been combined. In this reſpect it perhaps differs from moſt other combinations; but it muſt be conſidered that no power in nature has ſo many attractions operating upon it. If its combinations are more general, its diſſolutions muſt alſo be ſo: the ſame cauſes which produce the one muſt alſo occaſion the other. It has already been obſerved, that the univerſal attraction of all bodies for caloric gives it the predominance over all the material powers. It is by this capacity of uniting with all bodies in all proportions, that its effects are ſo very different. If united in ſmall proportions, it either affects the temperature, or it is abſorbed, and ſeemingly loſt, in the other properties of body; but if it is united in great quantities it changes the body. It knows no point of ſaturation; but when its power has arrived at a certain pitch, it becomes predominant, and every thing yields to its unbounded ſway. It is, however, manifeſt that its operations do not proceed from another principle, nor has it a different ſource of action than is common to the material powers. Its action is only more general, becauſe it is not chained down by elective attractions which circumſcribe the other powers.

I am aware that the elective power of other kinds of matter has been denied; and a late writer has affirmed, that the ſtrength of affinity depends entirely on the proximity of the particles of the combined body. But this appears to me to be neither conſonant to reaſon nor to known facts. If proximity were the ſole cauſe of affinity, how could an exiſting combination be decompoſed? The particles of an exiſting combination having got within the proximate diſtance, how could the particles of a third body get near enough to ſupplant the former, if there were not a ſtronger affinity betwixt them and ſome of the component parts of the exiſting combination? Oil and water cannot be combined but by means of a third body; yet this third muſt have a tendency to ſeparate rather than unite their particles. Again, if this proximity were produced by the form and denſity of the particles, the ſtrongeſt attractions would always be produced by thoſe kinds of matter whoſe form was moſt favourable to proximity; but we find that the ſtrongeſt attractions are produced by thoſe powers which act at ſenſible as well as inſenſible diſtances. The attractions of the magnetic and the electric fluid for particular bodies are made without any regard to proximity: they act not only at ſenſible diſtances, but, in ſpite of proximity, they will operate upon their elective favourites, through ſolid and fluid bodies equally as void ſpace. The more general attractions of caloric alſo diſregard proximity. It looſens the ſtrongeſt bonds; it ſeparates the parts of the moſt ſolid bodies; its action overcomes the neareſt proximity; it thruſts itſelf in betwixt the choiceſt friends and the oldeſt connections, and ſeparates them with relentleſs ſeverity. Even in thoſe caſes where the ſmallneſs of its quantity permits the particles of bodies to exiſt together, it ſtill muſt have the inmoſt place, and therefore expands their bulk and widens their proximity. If the combinations of light which come mixed together, were effected by proximity, how is it that bodies combine with ſome kinds and repel others? All theſe facts can only be explained by an elective power, and are altogether contrary to every idea of proximity. But let us return to the ſubject of caloric.

There is another queſtion concerning heat ſo much connected with the ſubject that I cannot paſs it over. I confeſs, however, that I enter upon it with conſiderable diffidence. The object of inquiry is concerning the ſource or origin of caloric. Does this ſubtle fluid originally belong to our earth? or is it derived from the ſun, and communicated to us along with the light? This laſt opinion has always been the moſt prevalent; but with deference to general opinion, I beg leave to expreſs my doubts upon the ſubject. The firſt time I thought upon it I was ſtruck with the vaſt difference beetwen the ſuppoſed velocity of its paſſage from the ſun and its progreſs through body. In its journey from the ſun, its progreſs is ſuppoſed to be equal to 200,000 miles in a ſecond. It is ſaid to have a twofold motion through body:

By the firſt, it is ſuppoſed to be tranſmitted, and to paſs through with the ſame velocity as through void ſpace; ſecondly, to be conducted through it, and to paſs with different degrees of ſlowneſs. Admitting that caloric is poſſeſſed of an equal power of being tranſmitted or conducted through different bodies, it might at leaſt be expected that the velocity of its paſſage through the ſame body would always be equal: but this is by no means the caſe. In its approach to the earth it is ſuppoſed to paſs through the atmoſphere with the velocity of tranſmiſſion, ſo that the upper regions are not warmed by it; but it is very certain that its retrograde marches through the atmoſphere, in order to diffuſe an equal temperature among bodies, are very ſlow. It is entirely contrary to the unalterable nature of the material powers to act different in exactly ſimilar circumſtances. They have but one mode of acting, and this mode is invariable, as has been formerly ſhewn. How then is this to be accounted for? The atmoſphere is the medium of its communication with different bodies as well as of its paſſage from the ſun; and if it paſſed with the velocity aſcribed to it in the one caſe, why does it not paſs with equal velocity in the other. If caloric were poſſeſſed of the ſame velocity as light, it would leave the earth with the ſame rapidity, and we ſhould be deprived of ſenſible heat, equally as much as of ſenſible light. Again, if it were tranſmitted from body to body, and through the atmoſphere with the velocity of tranſmiſſion aſcribed to it, the whole earth would be inſtantly brought to an equal temperature. There could not exiſt in the ſame globe regions of piercing cold with tracks of unſupportable heat: ſuch extremes as are found in our earth are altogether irreconcilable with the exiſtence of a fluid endued with ſuch velocity, and the inherent capacity of preſerving an equal temperature. The vaſt difference of velocity betwixt caloric and light is perfectly apparent to our ſenſes in every caſe of combuſtion: the light of a candle ſpreads inſtantaneously to very conſiderable, but the heat can only be felt at very ſhort diſtances.

The action of light always correſponds with the velocity aſcribed to it: its effects are inſtantaneouſly felt over the whole horizon: it paſſes from body to body, even the moſt denſely tranſparent, with as much velocity as through void ſpace. Its retrograde marches, its refractions and reflections from one body to another, preſent no apparent difference in velocity from that by which it comes from the ſun. Its motion is entirely diſſimilar to that of caloric. Light proceeds in ſtraight lines, with a velocity perfectly conformable to our idea of a power darting from planet to planet and from ſun to ſun. Caloric is as ſlow in its motion as the other is rapid: it paſſes equally by curved as by ſtraight lines; and its whole character is altogether unlike that of a traveller into foreign lands. Its motion is not uniform: there is a difference in the time it requires to paſs through different bodies. In ſhort, it appears rather to be dragged by the different attractions of body, than to fly with any inherent velocity of its own.

The experiments of Pictet have been ſuppoſed to prove the tranſmiſſion or projection of caloric in ſtraight lines with extreme velocity. He placed two concave mirrors oppoſite to each other, and by placing a heated body in the focus of the one, and a very delicate thermometer in the other, the heat was thrown from the hot body to the thermometer at the diſtance of 69 feet. The moment the ſcreen was removed from betwixt them, the thermometer roſe: from which he ſuppoſed, that caloric moves with all the volocity of light, and by the ſame ſort of motion. It muſt be admitted, that experiment is the true teſt of theory; but when particular facts are contrary to general laws, it requires ſome caution to draw general inferences from them. Another experiment of his that may help us to explain the cauſe of this phenomenon at leaſt ſhould prevent us from drawing raſh concluſions concerning the velocity of caloric He placed a glaſs mattraſs full of ſnow in the focus of the one mirror, and a thermometer in the other. The thermometer ſunk ſeveral degrees, and roſe again when the mattraſs was removed. When nitric acid was poured upon ſnow, a mixture which greatly increaſes cold, the thermometer ſunk 5° or 6° lower.

On conſidering this experiment, it is undeniable that the reaſoning brought to ſupport the radiation and velocity of caloric by the firſt experiment, will, by the ſecond, tend to prove the radiation of cold: yet few philoſophers, I believe, will contend that cold has any exiſtence at all. I conceive, with Dr. Hutton, that light is concerned in all theſe experiments. I do not, however, coincide with him in opinion that light occaſions the riſe or fall of the thermometer. There is more reaſon to ſuppoſe that the caloric is either combined with light, or is tranſported by it. The whole phenomona attending theſe experiments are ſo contrary to the regular action of caloric, that it ſtaggers my belief to conceive it capable of ſo contradictory a mode of acting. On the other hand, it is evident from ſome of theſe experiments that it correſponds ſo entirely with the nature of light, as to give ground to believe it to be the agent in tranſporting it. This radiant caloric obſerves all the peculiar laws of light with great exactneſs. It moves in ſtraight lines; it is reflected and refracted; and, what is equally remarkable, its temperature is augmented when the ball of the thermometer is blackened. Now, theſe modes of acting, and this property of being abſorbed by a blackened ball more than when it is not ſo, belong entirely to the nature of light, and to no other power in nature, ſo far as has been diſcovered.

The apparatus employed in theſe experiments was ſuch as muſt have aſſiſted the action of light in a high degree, by concentrating its force into a focus; and it cannot be ſhewn that heat ſeparated from light is ever concentrated in this manner. If light have an attraction for caloric, it muſt, in this accumulated ſtate, carry off the heat with all the velocity peculiar to it: it muſt again be concentrated by the focus of the other mirror upon the ball of the thermometer; and the heat it carries along with it muſt therefore affect it in proportion to the quantity there accumulated. By this view of the facts, the velocity of the caloric is eaſily accounted for; but ſhould we attempt to explain it by the laws which govern it in all other caſes, it will be found impoſſible to make them correſpond. When a ſcreen was placed between the two mirrors, its action was completely obſtructed: now, as the motion of caloric is not confined to ſtraight lines, why ſhould this be the caſe? The motion of the electric fluid is not ſtopped in this manner: it paſſes through bodies impervious to light with the ſame velocity as through air; and no reaſon can be aſſigned why caloric ſhould, in this inſtance only, be tied down to the laws of light, if it were not carried along with it. In all theſe experiments it was found that what had obſtructed the progreſs of light alſo obſtructed the progreſs of caloric. There is therefore every reaſon to ſuppoſe, that the velocity of the latter is entirely owing to the action of the former. When we perceive a piece of cork carried along by a ſtream of water, we inſtantly aſcribe its motion to the action of the water. On what principle do we found our opinion? Becauſe we know that the cork has not this capacity when ſeparated from the water. The argument is equally concluſive in the caſe of caloric; and its velocity, from the ſame principle, muſt be aſcribed to the action of light, as it cannot be ſhewn, that caloric is poſſeſſed of this power when ſeparated from light. The more we examine facts, the more evidence we ſhall find to confirm the opinion, that caloric is tranſported by light. Conſider how rapidly heat ſpreads over the ſurface of the earth upon the riſing of the ſun, and how contrary this is to the ſlow motion by which it is governed in other caſes; what difference there is between night and day, and betwixt thoſe regions that are left in utter darkneſs and thoſe which the ſun enlivens with his beams: Obſerve, that whatever obſtructs the light alſo obſtructs the heat; that light is always preſent in all high degrees of heat; that it attends the electric fluid in all its flights, and all the rapid operations where heat is concerned. Conſider the vaſt quantity of heat accumulated in the focus of a burning glaſs placed in the ſun-beams, although by itſelf caloric penetrates glaſs with great difficulty and extreme ſlowneſs. It is equally inconceivable how caloric could be reflected except by means of light. Reflection ariſes ſolely from repulſion, and this is owing to the heterogeneous nature of light, and the capacities the different kinds have of combining with or being repulſed by different bodies. The reflected light is like a ball rebounding back from a wall againſt which it has ſtruck with force; but we know of no bodies that have a repulſion to caloric, neither has it been diſcovered to be a heterogeneous body: it is therefore impoſſible that its reflection can ariſe from any of thoſe cauſes which affect light. Refraction is alſo peculiar to light: it ſeems to ariſe ſolely from the nature of its motion. When a cannon ball paſſes through a body, it ſuffers a ſort of refraction, and is hurried out of its ſtraight courſe. It is therefore peculiar to bodies moving in ſtraight lines, and cannot correſpond with the motion of caloric, which is never tied down by this law. Again, the riſe of the thermometer on blackening the bulb is ſo conformable to the character of light, that it does not bear another interpretation. It is well known that black bodies abſorb all the kinds of light; and if heat is tranſported by its rays, it muſt be accumulated in greater quantities than when it is reflected and thrown back. The riſe of the temperature is therefore an effect ſuch as might be expected from the abſorption of light, and can be accounted for on no other principle whatever.

The experiments with cold bodies are ſtill more deciſive, as they could only be performed by the agency of light. Cold is not an exiſting ſubſtance, it is merely the privation of heat, and could neither radiate nor reflect. The radiation and reflection which here took place, muſt therefore have been performed by ſome exiſting ſubſtance paſſing betwixt the two mirrors. What other agent beſides light could act in the manner here performed? The action of air could not do it, as it poſſeſſes no radiating power, and can only act by the ſlow motion of proceeding from particle to particle.—The only power capable of performing it is light, which, by flying in ſtraight lines, and having its action here concentrated, could produce ſuch inſtantaneous effects. It is thus that when it acts upon a hot body it carries heat away from it, and when it acts upon a cold body, it parts with a proportion of the heat it is poſſeſſed of.

It may be aſked, where the light came from in theſe experiments, as ſome of the heated bodies were boiling water, and others iron balls heated ſo

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as not to be viſible in the dark, I anſwer, the operator muſt have made uſe of light, whether the experiments were made by night or by day, and this light, when concentrated by the focus of the mirror, was ſufficient to tranſport the quantity of caloric which occaſioned the riſe of the thermometer. If the experiments had been tried in various degrees of light, I doubt not that the accumulation of heat would have been in proportion to the quantity of light. In a ſtrong light the thermometer would have riſen the more, and in a weaker light the leſs. This of itſelf would have been deciſive of the queſtion.

It will be ſaid that this reaſoning is not concluſive concerning the increaſe of heat by the ſun's light, becauſe the ſun communicates heat as well as light. This brings us back to the queſtion firſt propoſed, Does caloric proceed from the ſun, or from what ſource is it derived?

Before expreſſing my doubts as to the validity of the general opinion upon this ſubject, I muſt call the attention of my readers to an obſervation formerly made, that if caloric poſſeſſed the ſame velocity of motion as light, the whole earth muſt neceſſarily be brought to an equality of temperature almoſt inſtantaneouſly. It is one of the known laws of caloric, that it never ceaſes its efforts to reſtore an equal temperature; and nothing prevents it from performing it, but the ſlowneſs of its motion. If caloric paſſed from the ſun in 7 minutes and a half, how much ſooner would it paſs from one part of the earth to another? If it paſs thro' the atmoſphere with ſuch velocity in its approach to the earth, it muſt have the ſame capacity to ſpread through it over the earth's ſurface. The force of theſe arguments is ſo ſtrong as to leave no doubt upon the mind of him who duly conſiders the ſubject. The conſequence undeniably is, that caloric is not poſſeſſed of that rapidity of motion aſcribed to it; and if you ſtrip it of that capacity, how unlike is it to the character of a ſlowly moving power, to travel ſuch immenſe journeys as from the ſun to the earth and the other planets?

Every view we take of this ſubject points out ſome eſſential objection to the opinion of caloric coming from the ſun. The ſlow motion of caloric, as we have ſeen, is as unfit for travelling ſuch immenſe journeys, as the rapid motion of light is adapted for it. Light leaves us with the ſun; not a particle is left but what is in a ſtate of combination, reflected by the atmoſphere, or communicated by the moon and ſtars. On the contrary, caloric never leaves us; and though the force of the heat is much diminiſhed, a large quantity ſtill remains. Even in thoſe regions deprived of the ſun for one half of the year, as much remains as is ſufficient to ſupport animal life. Both vegetable and animal life admit of a temporary deprivation of light; but the ſyſtem of nature could not exiſt one moment without heat.

If caloric be communicated by the ſun, it is impoſſible to account for the great degree of cold which prevails in the upper regions of the atmoſphere. It is vain to talk of the power of tranſmiſſion in order to account for it. No body in nature permits another for which it has a ſtrong attraction to paſs through, until it is at the point of ſaturation; and if the ſtrength of affinity be always in proportion to its diſtance from this point, it is abſurd to ſuppoſe that the colder parts of the air ſhould communicate caloric to the warmer without ſupplying itſelf. This is contrary to all the laws of affinity, and alſo contrary to the capacity of caloric for preſerving an equality of temperature.

There is a ſtill ſtronger objection to the opinion of caloric coming from the ſun, ariſing from the vaſt accumulation of heat which a daily flow from the ſun would produce upon the earth. The quantity of light communicated by the ſun to the earth is inconceivable: much of it is combined with earthly bodies, but the far greater part is impelled to other planets, and in all probability finds its way back to the ſun. But the inveſtigations of philoſophers will not allow us to ſuppoſe this to be the caſe with caloric. It has been found by experiment, that the rays of the moon, even when concentrated by a concave mirror, ſo much as to exceed the brighteſt candles in light, produce not the ſmalleſt change upon the thermometer: it is therefore evident that no heat comes from the moon. What is the obvious inference to be drawn from this? If the moon gives out no heat, we are compelled to believe that it receives none or that it is accumulating. The idea of a continual accumulation of ſuch a powerful fluid as heat is abſurd. The accumulation of a century would render the moon a maſs of liquid fire equal to the ſuppoſed heat of the ſun itſelf. It is impoſſible to admit this opinion; and we muſt neceſſarily believe that as the moon gives out no heat, ſhe receives none; If the ſun communicates no heat to the moon, it can give none to the earth, becauſe its rays cannot be of one compoſition to the moon and another to the earth. The ſource of ſupply is the ſame, and therefore the material effect cannot be different.

I conſider this argument deciſive, becauſe the fact it is founded upon is altogether irreconcilable with the opinion that the matter of heat comes from the ſun. The idea of accumulation is contradicted by the hiſtory of the world: no increaſe of heat has been felt, and the conſtitution of nature is ſuch as not to admit of it. A few degrees more heat would render the torried zone uninhabitable, We are therefore compelled to believe, that if the earth receives heat from the ſun, it muſt give it out again. But the forementioned experiments with the moon's rays will not admit this idea: for if the earth receives no heat from the moon, there is no reaſon to believe the moon receives any heat from it. The circumſtances of the earth and moon are in this reſpect ſo much the ſame, that if the latter gives out no heat, it would be abſurd to ſuppoſe the former could. The principle of accumulation is ſtronger againſt the moon than the earth; being a ſmaller body it would be ſooner heated than the earth, and the law of caloric for producing an equal temperature would, in ſuch a monſtrous caſe of accumulation and diſparity, compel it to part with its heat.

Another point of inquiry concerning caloric is, whether it poſſeſſes only one property, or is ſubject to the changes in its mode of exiſtence which are common to all the material powers. Nothing appears more evident than this, that if caloric is not derived from the ſun, it muſt have an exiſtence otherwiſe than is apparent by its property of heat. The quantity of heat that exiſts by day is greatly diminiſhed in the night. What becomes of it? Is its ſubſtance annihilated? No---it appears again next day. What becomes of the heat of the polar regions in the long abſence of the ſun? Is it loſt? No; it appears again on his return. It muſt, however, in that interregnum have changed its mode of exiſtence, and it evidently has this capacity, as a quantity is always loſt by the converſion of ſolids into liquids and liquids into vapour. The univerſality of heat may be ſuppoſed to militate againſt this opinion; but it muſt be remembered, that its attractions are in like manner univerſal, and that in thoſe ſyſtems where heat is moſt neceſſary, a continued courſe of action, and conſequently heat, is kept up by organization. By means of this, in the polar regions, a temperature about 96° is kept up in the animal frame in the midſt of bodies below 0°, although theſe are continually abſtracting its heat, in conſequence of the law of equal diſtribution. But notwithſtanding the univerſality of its attractions, its action muſt finally ſtop, were it not for the periodical return of the ſun.

This view of the nature of caloric is more correſpondent with the general character of matter than thoſe generally entertained. It explains the grand principle by which it acts; and, inſtead of making caloric an exception to all the other kinds of matter, ſhews that its ſuperior power is only owing to its more general attractions, and that it has no independent and inherent ſource of action different from the reſt. Among members of the ſame family, there is ſomething prepoſterous in the idea of one being paramount to all others, and having nothing in its nature common with them; but by adopting this view we are enabled to trace its genealogy, and unite it with its brethren. It explains the whole phenomena of heat. It ſtill repreſents the ſun as the great agent in the production of heat, without ſuppoſing it to be an enormous maſs of fire, the exiſtence of which would neceſſarily deſtroy itſelf and all nature with it. We have only to conſider the ſun as the great ſtorehouſe of light; a power indeed the moſt active in nature, but noways deſtructive, like that terrible body fire. It ſhews that light produces heat merely by exciting, an inſenſible action betwixt caloric and the particles of matter contained in bodies. It accounts for the want of heat in the upper regions of the atmoſphere by the want of ſufficient matter to produce the action of caloric; and for the cold of the night and the polar regions, by the want of that action which the ſun produces. It deſtroys the abſurd opinion concerning tranſmitted and conducted heat, ſo contrary to the invariable character of all the material powers. It ſhews that caloric is not an exception to all the other kinds of matter, but that, like its fellows, it exiſts in other characters beſides heat. It enables us to ſolve the great difficulty concerning the diſtribution of heat among the different planetary bodies: according to this view, thoſe neareſt the ſun may have no more than thoſe at the moſt remote diſtance. We have only to ſuppoſe the quantity of caloric to be proportioned to the diſtance; and if a ſmall quantity exiſts in Mercury, no more heat may be excited than is done by a large quantity in Saturn.

There ſtill remain ſome other points of inquiry concerning heat. It will be aſked, how heat is produced, if it come not from the body of the ſun? I can only anſwer this queſtion by referring it to the ſource which is common to all material powers. The action of light upon body produces colours; that of air upon body produces ſounds. In like manner the action of caloric upon body produces heat. It has always been obſerved, that the ſun's rays have not the ſame power in producing heat when they fall obliquely as when they fall perpendicularly. This ſerves to ſhew that the increaſe of heat depends much upon the momentum or force with which light acts upon body. If the increaſe of heat depended upon the quantity of light communicated by the ſun, there could be no difference in whatever angle it fell; but as the force of its action upon ſolid bodies muſt be augmented by the perpendicular ſtroke, there is reaſon to infer that the increaſe of heat is much owing to this cauſe. It has been ſuppoſed that there is a repulſion betwixt the particles of caloric and light; but I cannot conceive how two ſubſtances which are generally found together ſhould have a repulſion eſtabliſhed betwixt their particles. It is more natural to ſuppoſe that there exiſts a ſtrong attraction betwixt them; and that in conſequence of the action produced by this attraction and combination of theſe two very ſubtle fluids, heat is produced. Light ſeems to have the capacity of producing heat above all the other material powers, and it is preſent in all high degrees of heat. Its great power in the production of heat probably ariſes from the rapidity of its motion and the univerſality of its action. It is the firſt cauſe of action in the ſyſtem of nature, and it excites ſuch a quantity of motion over the face of the globe as to ſet all the ſubtle fluids in action. It is more powerful in exciting heat in ſolid bodies than among fluids by themſelves, probably becauſe it produces a more forcible action among the particles. It produces more in dark than in light bodies, becauſe theſe having a greater capacity for its abſorption, a ſtronger degree of action is excited among them.

Although light is the chief, it is not the only agent capable of producing heat. The action of oxygen upon combuſtible bodies is another very powerful agent: percuſſion and friction alſo produce it. In general, whatever tends to produce a high degree of action among bodies cauſes heat. Thus, motion is found to be a powerful agent in its production, becauſe it increaſes the action of one kind of matter upon another. Shall then recur to the opinion that heat conſiſts in mere motion? By no means: this unnatural opinion has already been diſcarded. It only leads us to ſuppoſe, that inſtead of heat coming from the ſun, it is a property of a very ſubtle fluid called caloric, which is brought into action by ſome of the other material powers. This entirely correſponds with the opinion we have already formed concerning the two nobleſt of our ſenſes, viz. ſeeing and hearing: it connects them together in the ſame relation; it claſſes them as brothers in the ſame family, by uniting it to two of the moſt ſubtle powers in nature. Let us now proceed to the conſideration of light.

Light is undoubtedly in ſome reſpects an exception to the general law of attraction as it affects the planetary bodies; for inſtead of being confined, like other matter, to one body, it travels over all ſpace, viſiting every planet, exciting action, producing colour, enlightening and enlivening all nature. It appears to us to be an exotic production, and the firſt object of inquiry concerning it is, By what energy is it ſent forth from the body of the ſun? There are only two conceivable modes by which this can be performed. 1ſt, By a repulſive power eſtabliſhed between particular ſorts of matter and different kinds of light; 2dly, By the attractions of the planetary bodies acting upon the ſun.

The exiſtence of a repulſive power is equally manifeſt, although not ſo general, as that of an attractive power; and it is more reaſonable to aſcribe the action of light to the principles which actuate other matter than to any unknown cauſe. Light, air, and probably all other gaſeous bodies, are poſſeſſed of a repulſive power to their own kinds. It is this property that not only prevents them from uniting in ſolid maſſes, but, if the particles are preſſed together by an external force, it cauſes them to fly off when the force is removed. Light has not only a repulſive force to its own kinds, but it alſo poſſeſſes a much higher degree of it to different other kinds of matter. That reflection ariſes from a repulſive force eſtabliſhed between particular kinds of light and certain bodies, has been already noticed. To account for the departure of light from the ſun, we muſt ſuppoſe this force alſo to exiſt in that body, and that it drives off the different kinds of light, in the ſame manner as the earth and the other planetary bodies. But how does this accord with the idea of the ſun being the ſource, the ſeat or rendezvous of light? This can only be accounted for by the vaſt ſuperiority of the ſun's attraction: it is the centre of attraction to the whole body of the planets; and if ſuch heavy bodies are drawn towards it by this power, it is but natural to ſuppoſe that the fluid of light ſhould alſo be attracted by it. If it is the centre of the planetary ſyſtem, it muſt alſo be ſuppoſed to be the ſource of light, becauſe they are both acted upon by the ſame power.

Another queſtion concerning light is, If the ſun has ſo ſtrong an attraction for it, how does it eſcape his powerful graſp at its ſurface where it is ſtrongeſt? I anſwer, in the ſame way that it eſcapes the earth's attraction at its ſurface. The body of the ſun muſt poſſeſs ſubſtances to repel it, as the body of our earth does. In both caſes the repulſive power acts like a ball ſtruck with force againſt a hard body, which rebounds back in the direction it came. The rebound of light muſt indeed have great force when it is able to counteract the general law of attraction; but it muſt be remembered, that it will always be aſſiſted by the counter-attractions of the planetary bodies which are in its courſe. Thus, though we ſhould allow that attraction is the ſtrongeſt as well as the moſt general power, yet when repulſion is aſſiſted by the attraction of the planetary bodies, it overcomes that of the ſun. The ſun's attraction is without doubt vaſtly ſuperior to that of any of the planetary bodies; but there is alſo reaſon to ſuppoſe, that his repulſive force is proportionally greater than theirs. If the velocity of light is in proportion to the ſtrength of the attraction, its velocity is greater at the ſun's ſurface than at the earth's in proportion to this difference; conſequently its repulſive force will expand in the ſame proportion.

This view will not accord with the idea of the ſun's body being ſolely compoſed of light and heat. It muſt have a variety of the kinds of matter to attract and repel, in the ſame way as other planetary bodies. Indeed, independent of this view, the opinion of the ſun being wholly entirely compoſed of light and heat [illegible]. The particles of both light and heat are ſuppoſed to repel each other; and if this be the caſe, it is impoſſible that any body ſhould be compoſed of ſuch materials. It is attraction and adheſion which form bodies; repulſion only ſeparates them. A body poſſeſſed only of repulſive powers towards its parts, inſtead of keeping together, muſt ſeparate of itſelf, although no counter-attraction were to act upon it. Every man who conſiders the ſubject will perceive that the body of the ſun muſt have adheſive powers to keep its parts together, as well as a ſtrong attraction for other bodies, in order to become the centre of a ſyſtem ſupported by mutual attraction. It may be ſaid that this is merely hypothetical, becauſe we have no experiments to prove it. Attraction and repulſion are not hypothetical, but proved to have a real exiſtence in nature, and particularly in the caſe of light. The attraction of light is proved by its inflection, and its repulſion by its reflection.

We have no experiments, I grant, to prove that it comes from the ſun by reflection, nor ever can; but we are certain that our earth reflects it, and that the moon and all the planetary bodies reflect it. It is more natural and juſt to extend this general principle to its impulſe from the ſun, than to ſeek for a new power which is not known to have any exiſtence in nature. The action of the material powers is uniform and invariable: they do not act at one time on one principle, and on a different principle at another time. We are obliged to aſcribe its paſſage from the ſun to this principle, becauſe in all other caſes it is by this alone that it paſſes from body to body. It correſponds with the general analogy of nature; it is conformable to the Newtonian ſyſtem of planetary motion: in the one caſe, the centrifugal and centripetal forces balance each other; and in the other, the attractive and repulſive forces are equally balanced.

It will be ſaid, that according to the view which has been given of this ſubject, the ſun muſt be left in the dark as well as the planetary bodies. If it be the centre of a ſyſtem, it never can. Its ſuperior attraction will bring the light from all parts of the univerſe with inconceivable velocity and vaſt ſuperabundance. The quantity of light is immenſe. The ſuperiority of its attraction will always make the ſun the grand ſtorehouſe; and it [illegible] conſequence of [illegible] away. Under this head [illegible] another argument ([illegible] ſuppoſed) to [illegible] is not the ſource of heat. It is evident that caloric could not come from the ſun in this manner. It has an attraction for all matter, and is repelled by none: it cannot therefore come to us in the way that light does, nor can we point out any principle by which it could come; for whether it were the ſun or planets that we ſhould ſuppoſe to poſſeſs it, they muſt neceſſarily retain it, on account of the ſtrength and generality of its attractions. Upon this principle, therefore, we muſt renounce the idea of its coming from the ſun.

I ſhall now conclude this part of my inquiry by obſerving, that whatever may be thought of the arguments here advanced it muſt be evident that motion is not inherent in light. It is attracted, repelled and combined like other matter, and its motions are excited in the very ſame manner. If motion were inherent in its nature, no power in the univerſe could bend it. We muſt therefore conſider motion as an original power, and be content with that which matter combined with intelligence can produce.

## SECTION II.

### *Of the Character of Matter.*

OUR next ſubject of inquiry is concerning the origin of matter, and the rank it ought to hold in the ſcale of being. Is it ſelf-exiſtent, or is it a created ſubſtance?

Upon this queſtion which has occaſioned much controverſy, my reflections have made me diſſent from the common opinion. I ſhall therefore beſtow upon it particular conſideration. I ſhall, in the firſt place, examine how far the idea of a creative power correſponds with reaſon and the ſyſtem of nature's works; and, 2dly, inveſtigate the nature and character of matter, in order to aſcertain its claim to ſelf or eternal exiſtence.

The firſt object of inquiry is to examine how far the idea of a creative power correſponds with reaſon and the ſyſtem of nature's works. What is a creative power? It is explained to be the making of a thing out of nothing. We have heard this idea ſo often repeated from our infancy, and our minds are ſo much familiarized to it, that we do not perceive its abſurdity. But if we ſtrictly examine it, our credulity muſt be greatly ſhaken. We have a clear conception how one thing could be made out of another, but we cannot conceive how a thing can be made out of nothing; and our reaſon ſeems to pronounce it impoſſible. The old axiom, that nothing produces nothing, is not more evident than that nothing can be made out of nothing. If the firſt be juſt (and it has obtained univerſal conſent) the ſecond, which grows out of the ſame root, cannot be wrong. If the Deity has made matter, he muſt either have poſſeſſed the ſubſtance in himſelf or procured it from ſomething elſe. But if he be immaterial he could not have poſſeſſed it in himſelf, and if it be not in him, he could not communicate what he has not to give. There is nothing more obvious than that no being can give what he does not poſſeſs. If the Deity be neceſſarily ſelf-exiſtent, he can poſſeſs no more than he inherits by this neceſſary exiſtence. It makes no difference however high or low, great or ſmall, we ſuppoſe the being to be; as every being is limited by the capacities of its nature. The Deity is like all other beings in this reſpect; he can no more give what he does not poſſeſs, than any other being can give that which it has not. It is therefore impoſſible, on the ſuppoſition of his being immaterial, that the Deity could be the creator of matter. Again, if he poſſeſſed matter in himſelf originally and inherently, he cannot be conſidered either as immaterial or as its creator. I ſhall again repeat the argument —In every view of the ſubject it is perfectly evident, that if the Deity made matter, he muſt either have poſſeſſed the ſubſtance of it in himſelf or procured it from ſomething whitout him; and in either of theſe caſes he cannot be conſidered as its creator. If he made it out of himſelf, the ſubſtance muſt have exiſted in him, and conſtituted a part of his eſſence: but if it conſtituted a part of his eſſence, it muſt be as neceſſarily ſelf-exiſtent as he is. And if he made it of ſomething exiſting without him, he was not its creator in this caſe more than in the other.

The eternal exiſtence of matter is as ſtrongly impreſſed upon our minds as the exiſtence of the Deity can be. The conſtitution of our minds revolts at the idea of the non-exiſtence of matter. Let us try to conceive ſuch a ſtate, and we ſhall find it to be impoſſible; for whatever attempts we may make to eradicate the idea of its exiſtence from our minds, it will always remain within us. It is equally difficult to conceive how mind could make matter, as how matter could produce mind, and they ſeem both equally neceſſary in the ſcale of being. Without mind, all nature muſt have been a chaos; and without matter, there could have exiſted nothing upon which mind could work. Take away matter and its properties, (which indeed is a ſuppoſition that deſtroys the idea of our own exiſtence) and there would be nothing left to fix our minds upon, for we know nothing of ſpirit but as contraſted with matter. The exiſtence of matter ſeems as neceſſary to the Deity as to any other being; becauſe if all were a mere void, and nothing exiſted without him, he could have nothing upon which to exerciſe his great mind. A ſtate of non-exiſtence can afford no more exerciſe for his mind than it does for ours. The greatneſs and perfection of the Deity conſiſts in the knowledge of all that does exiſt; but what does not exiſt can afford no more ſcope for his powers than for ours.. It is evident therefore, that the idea of the non-exiſtence of matter, inſtead of exalting the character of the Deity, is altogether inconſiſtent with his nature; and, inſtead of rendering him independent of all other exiſtence, reduces him to a mere nullity.

I ſhall be told that the Deity poſſeſſes all things inherently in himſelf, and can ſtand in no need of any thing without him. I grant that his exiſtence and power are inherent in himſelf, and independent of every thing whatever: but it muſt be obſerved that mere exiſtence affords neither exerciſe nor enjoyment to a contemplative mind, and leaſt of all to an immaterial being; becauſe in him there are no variety of parts, no difference of ſubſtance, no objects of compariſon: all is ſameneſs: he is one and indiviſible. The mind which never knew but one thing, whatever be its powers, has no food upon which to exiſt. Variety is as neceſſary to mind as food to the animal body. Try in your imagination to place any being, who in himſelf poſſeſſes no variety, in a ſtate where nothing exiſts without him; whatever way you may conceive it, ſuch a ſtate would neceſſarily be a ſtate of non-exiſtence. The idea of immateriality by itſelf affords no exerciſe for mind. Mind is the object that thinks, and not the ſubject to to be thought upon, as we know nothing of it except by its action. The difficulty of making any thing ſpiritual the ſubject of thought is ſtrikingly illuſtrated by the hiſtory of religion. What is it that has produced the ſymbolic worſhip and the ceremonies of the Jews, the pomp and images of Paganiſm and the church of Rome, but the impoſſibility of making any thing immaterial afford by itſelf a ſufficient number of ideas to influence the paſſions, to affect the heart, and to inſpire the mind with true devotion and energy. Even the members of the Scottiſh church, tho' their principles lead them to condemn the ceremonial worſhip of their fellow Chriſtians, are ſtill obliged to make uſe of ſacraments, to repreſent ſpiritual things by external ſigns, and to employ metaphors drawn from material objects, to illuſtrate and enforce their doctrines.

I am aware it will be contended that the reaſoning here made uſe of is not applicable to the Deity, becauſe he is ſo far exalted above our comprehenſion that it is impious to ſet limits either to his power or his capacities. I acknowledge there is no anſwering this argument, as it puts an end to all inquiry: but let thoſe who make uſe of it conſider, that by denying reaſon the power of judging concerning the nature of the Deity, they deſtroy the foundation on which the proof of his exiſtence reſts. It is by the principles of reaſon alone that we diſcover his being, and are able to contend with atheiſm. It is the only weapon with which we can attack the ſceptic, as he laughs at any other. But reaſon will not permit us to adopt opinions contrary to the principles ſhe has engraven on our hearts, or to carry our views concerning the power of the Deity any further than his works warrant. If reaſon be a competent judge of the queſtion concerning his exiſtence, it muſt alſo judge of thoſe characters by which his exiſtence is eſtabliſhed. If we reject it in the one caſe, we have no right to plead its authority in the other.

It has been contended that it is not neceſſary to ſuppoſe more than one ſelf-exiſtent being. But when we find that the character of this being is totally different from the exiſtences we perceive, and when it is impoſſible, from the diſſonance of their natures, that he could be their creator, or yet have made them out of any thing exiſting in himſelf, the ſuppoſition becomes not only natural, but neceſſary to ſolve the difficulties which, on any other ſuppoſition, are inſurmountable.

Mr Locke is the only writer I am acquainted with who attempts to ſupport by reaſoning the opinion of a creative power; and as his arguments are compriſed in little bounds, I ſhall tranſcribe them, that the reader may have a full view of the controverſy. "You will ſay," he obſerves, "is it
"not impoſſible to admit the making of any thing
"out of nothing, ſince we cannot poſſibly con-
"ceive it? I anſwer, No: 1ſt, Becauſe it is not
"reaſonable to deny the power of an infinite be-
"ing becauſe we do not comprehend his opera-
"tions. We do not deny other effects upon this
"ground, becauſe we cannot poſſibly perceive the
"manner of their production. We cannot con-
"ceive how any thing but impulſe of body could
"move body, and yet that is not a ſufficient rea-
"ſon to make us deny it poſſible againſt the con-
"ſtant experience we have of it in ourſelves in all
"our voluntary motions, which are produced in us
"only by the free action or thought of our own
"minds, and are not, nor can be the effects of the
"impulſe or determination of the motion of blind
"matter upon our bodies; for then it could not
"be in our power to alter it. For example, my
"right hand writes while my left is ſtill: what
"cauſes reſt in the one and motion in the other?
"Nothing but my will, a thought in my mind:

my thoughts only changing, the [illegible] is ſtill, and the left moves. This is [illegible] which cannot be denied: [illegible] make it intelligible, and then [illegible] be to underſtand creation, [illegible] new determination to the animal [illegible] ſome make uſe of to explain [illegible] clears not the difficulty one jot [illegible] determination of motion in [illegible] eaſier nor leſs than to give [illegible], ſince the new determination given [illegible] muſt be either immediately [illegible] ſome other body put in [illegible], and ſo muſt owe its motion [illegible] of which leaves voluntary [illegible] gible as it was before. [illegible] is an overvaluing of ourſelves to reduce all to the narrow meaſure of our capacities, and to conclude all things impoſſible to be done, whoſe manner of doing exceeds our comprehenſion. This is either to make our comprehenſion infinite, or God finite, when what he can do is limited to what we can conceive of it. If you do not underſtand the operations of your own finite mind, do not deem it ſtrange that you cannot comprehend the operations of that eternal infinite mind who made and governs all things, and whom the heaven of heavens cannot contain."

Mr Locke is a very acute writer; but in the above paſſage, there is a weakneſs and deficiency in his arguments apparent at firſt ſight. 1ſt, The whole of his arguments are negative, and prove nothing, whereas the queſtion required a poſitive proof. 2d, His view of the power of matter (given in another part of his work) is erroneous, as he contends, that the only way in which matter acts is by impulſe; but the diſcoveries of his own and later ages have rendered this opinion ridiculous: 3dly, He founds his reaſoning upon a principle reſpecting the character of the Deity which, in the next chapter, we ſhall endeavour to ſhew is erroneous. 4thly, There is no analogy or reſemblance betwixt the facts he adduces and the thing he intends to prove. The power of mind in the direction of the motions of our bodies is not to the purpoſe; for there is no ſimilarity betwixt the power of direction and that of creation. The firſt is a common principle in nature, the latter is altogether unknown and utterly inconceivable. Weak man himſelf poſſeſſes a directive power over a conſiderable part; but who would ſuppoſe from this that he was entitled to claim creative power? The common-place argument, that it is not reaſonable to deny the power of the Deity becauſe we cannot comprehend his operations, is only an evaſion, and leads us away from the true ſtate of the queſtion. It is not becauſe it is above our reaſon, or that we cannot comprehend it, but becauſe it is contrary to reaſon, to the united teſtimony of all nature's works, and has not a ſingle fact or principle to ſupport it.

I grant that we are obliged to believe many things we cannot comprehend; but we cannot be juſtified in believing any thing contrary to reaſon, or which involves an impoſſibility in its nature as this does. It is not becauſe a ſubject is above our comprehenſion that we are called upon to believe it; on the contrary our belief muſt be founded upon ſomething we do comprehend and perceive, and which neceſſarily implies and confirms the truth of what we cannot. It is unneceſſary to follow Mr Locke any further, as I conceive the ſubject ſufficiently illuſtrated. Let us therefore take a view of the other ſide of the queſtion, and,

2dly, Inveſtigate the nature and character of matter, in order to determine what right it has to the claim of ſelf-exiſtence. In entering upon the ſubject, it is neceſſary to have a clear idea of the character requiſite to form a ſelf-exiſtent being. The character of a ſelf-exiſtent being, as explained by Dr Clarke, is equally inapplicable to the Deity as to matter. He contends, that "unleſs the material world exiſt neceſſarily, by an abſolute neceſſity in its own nature, ſo that it would be an expreſs contradiction to ſuppoſe it not to exiſt, it cannot be a ſelf-exiſtent being."

This definition of ſelf-exiſtence tends more to confuſe our ideas than to elucidate the ſubject. Self or eternal exiſtence is altogether independent of our conceptions; it ſtands ſecurely on its own baſis, whether our conceptions be right or wrong; and that they are often wrong is proved by the contradictory opinions which have ever been held upon the ſubject. Neither the idea of the Deity exiſting by himſelf without a material world, nor that of the ſelf-exiſtence of matter independent of Deity, implies a contradiction; for ſome have denied the one and ſome the other, and it cannot be ſaid that either have contradicted themſelves, although both opinions appear to me to be equally contrary to truth. We ſhall therefore reject this definition, and ſtate the queſtion anew. What is ſelf-exiſtence? It is an exiſtence that cannot be deſtroyed. Every thing that has been made may be unmade; but that which cannot be deſtroyed muſt have the cauſe of its exiſtence in itſelf, and therefore muſt be eternal. We may attach as many fanciful properties as we pleaſe to the idea of ſelf-exiſtence; but all that is eſſential to it is included in the idea of indeſtructibility. This, therefore, is in my opinion the hinge of the controverſy, and to this point alone we ſhall direct our attention, Is matter deſtructible, or not?

I believe it to be a queſtion that will bear very little diſpute in the philoſophic world. The an-

[illegible]

[illegible] The expences and [illegible] bodies in [illegible] weighing the me- [illegible] he found [illegible] the fiery [illegible] to have lost, [illegible] have gained, in [illegible] supposed, that the [illegible] equal to [illegible] For as it is [illegible] indefensible; [illegible] The same matter is found, after every change, to be capable of the ſame combinations. You may reduce and again reſtore; you may add or ſubtract, multiply or divide; but its inherent powers are neither loſt nor diminiſhed by theſe operations. In the ſame ſtate, whether it be ſolid or fluid, whether combined or ſeparated, the ſame matter is always found to be poſſeſſed of the ſame properties. You may not only ſubject it to every ſort of change, but alſo for any length of time, yet its powers will continue equally unimpaired. The matter of the calcareous rock, as was already ſtated, which has been kept for ſeveral thouſand years in a ſolid ſtate, reſumes its former activity the moment the combination is diſſolved.

It would be impoſſible to enter into a detail of all the facts which prove the indeſtructibility of matter. If any man is ſtill ſceptical on the ſubject, he has it in his power to ſatisfy himſelf by making farther experiments. There is an apparent waſte of matter in the operations of nature: every operation produces a change by the diſſolution of a former combination, and the production of a new one; but in all theſe changes there is not a particle loſt. Conſider, for example, the apparent waſte of oxygen by the inſpiration of animals, and the formation of water. About one fourth part only of the atmoſphere is compoſed of this fluid, and all animals are continually abſtracting large quantities, the formation of water ſtill more; but notwithſtanding this apparent waſte, the atmoſphere is found by experiment to contain as much as ever. The fact is, that though all bodies are liable to be changed or deſtroyed, the matter of which they are compoſed is found to be incapable either of change or deſtruction. If matter were at all deſtructible, is it poſſible that it could reſiſt being ſo by the changes it is continually undergoing? What is the common idea of deſtruction? It is the ſeparation of the parts of a body formerly united; it is the breaking up of a former connection by ſuperior attraction and power: this we daily ſee take place; but every experiment proves that the materials are never deſtroyed. In the caſe we have ſtated, the oxygen inſpired by animals is again given out in the form of carbonic acid; this acid is greedily imbibed by plants; which again, by the agency of the ſun's light, communicates the oxygen to the atmoſphere in a pure ſtate. Thus animals furniſh food for vegetables, and vegetables ſupport animals. In the ſame manner, condenſation abſtracts oxygen and hydrogen from the atmoſphere, and forms water, which by evaporation is again returned in endleſs ſucceſſion.

Thus all the changes which take place, all the warfare carried on betwixt the contending powers, and all the deſtruction of body that enſaes, neither affects the exiſtence nor impairs the properties of matter. To our ſenſes it indeed appears as if it were deſtroyed, becauſe we are incapable of following its courſe, but after every poſſible trial, after every experiment, after its properties have been ſome thouſand years in a ſtate of diſuſe, it again appears in all its glory, with unabated activity and undiminiſhed ſplendour.

It may be ſaid, that it is only indeſtructible becauſe the Deity has made it ſo. But is it poſſible that the Deity could communicate to any other thing that which is the diſtinguiſhing property of his being? This would be making his creatures equal to himſelf; it would be beſtowing upon them a property which he could not have taken to himſelf if he had not originally poſſeſſed it. The opinion is abſurd.

The eternal exiſtence of the Deity is admitted upon evidence ariſing from the principles of reaſon alone, without any ſupport from ſenſe or experiment. With what conſiſtency then can we reject the claim of matter, when both experiment and reaſon concur in ſupporting it? If the voice of reaſon is to be heard in ſupport of the exiſtence of the Deity, it muſt alſo be liſtened to in ſupport of the claims of matter.

I ſhall conclude this chapter with a ſhort examination of an opinion advanced by Mr Hume in his *Sceptical Doubts* concerning the power and the uſe of reaſon, which I conceive, the principles we have laid down will enable us to refute.

I coincide with Mr Hume in opinion, that all our knowledge of natural bodies, and of cauſes and their effects, is derived from experience: but I cannot admit the concluſion he draws from this principle. He contends that reaſon is only uſeful in mathematical ſcience; and that in judging of cauſes and their effects it is altogether inſufficient for any philoſophical purpoſe. In judging of the evidence of facts, and tracing the connection between cauſes and their effects, I allow that the powers of reaſon are not always applicable, nor are they neceſſary; becauſe many caſes are ſo clear and ſatisfactory, the effects ſo uniformly following the cauſe, as to ſuperſede the neceſſity of all reaſoning. Theſe caſes are like the axioms of mathematics, which no reaſoning can make clearer; and to attempt to demonſtrate the truth of them would be altogether abſurd. But this affords no proof that reaſon is inſufficient and uſeleſs in all ſuch inquiries as Mr Hume alludes to. There are innumerable caſes ſo complex in their nature, and where the evidence upon which the concluſions are founded is ſo remote and inacceſſible, as as to require a combination of facts and circumſtances to determine the queſtion: and when this is the caſe, reaſon is indiſpenſably neceſſary. Will any man ſay, that Copernicus, in determining the courſe of the planets round the ſun, or Newton, in eſtabliſhing the cauſe of their circular motion, made no uſe of the powers of reaſon? or can he conceive that theſe queſtions could have been determined without it? I admit that their opinions are founded partly on facts and partly on mathematical principles; but ſtill it required a combination of both to eſtabliſh their concluſions; and this could not have been performed without the powers of reaſoning.

Mathematical principles have a certain uniformity of character, and poſſeſs this advantage, that the evidence upon which the reaſoning is founded is always clear and open to us. But when we direct our inquiries to the operations of nature, we enter a larger and a more diverſified field. Here the evidence is often very remote, and ſometimes altogether indiſcoverable; conſequently the reaſoning in theſe caſes muſt be in proportion more difficult, and in the caſe laſt mentioned leſs ſatisfactory. But this inequality and uncertainty in ſome caſes by no means operates againſt the uſe of our rational powers in all queſtions of phyſical inquiry. In the greater number of theſe caſes, the evidence is as ſatisfactory, and the reaſoning as clear, as any thing can be. Truth always carries its own evidence along with it; for even in thoſe caſes where falſe principles have been eſtabliſhed, and wrong concluſions drawn from them, no ſooner is the truth diſcovered, than the former gives way, and doubt and uncertainty are removed. How is it that the ſyſtems of Copernicus and Newton have prevailed over all the oppoſition they encountered? but that they collected a ſufficient force into the field, and, like able generals, arranged and led them on to battle with ſkill and conduct. This could have been done only by the powers of reaſon.

Hume contends, that the evidence of facts is leſs certain in its nature than the principles of mathematical demonſtration; becauſe the contrary of every matter of fact is poſſible. I admit, that every fact is not ſo certain as the principles of mathematics; becauſe, as already obſerved, facts do not always poſſeſs the ſame uniformity of character: but I contend that there are certain claſſes of facts as invariable in their nature, and as much to be depended upon, as any mathematical demonſtration can be; I mean thoſe that are founded upon the unchangeable characters of matter, and thoſe that are derived from the evidence of our ſenſes. I am as certain that a ſtone is hard, that fire burns, and that water in a certain temperature is always frozen, as I am that two and two make four; becauſe the properties of matter are as invariable as modes of relation. In all theſe caſes, the contrary can no more happen than the calculations of arithmetic can change their reſults. We can no more perſuade ourſelves that the fire will not burn, that a ſtone is not hard, than we can believe that the relations of numbers will change. Here then is a reaſon why, we muſt believe that the ſame cauſes will always produce the ſame effects. It ariſes from the ſelf-exiſtence and immutability of matter. The ſame kinds of matter will always poſſeſs the ſame qualities, and therefore, in the ſame circumſtances, will always produce the ſame effects. This is a propoſition equally clear, and the principles upon which it is founded are as certain in their nature, as any thing we can conceive under the head of mathematical demonſtration. It is the baſis upon which all nature reſts: it is confirmed by all experience, as much as it is demonſtrable by theory. Mr. Hume forgets the unchangeability of matter when he denies that ſuch an inference can be drawn by a chain of reaſoning. He contends, "That experience can only be allowed to give direct and "certain information of thoſe preciſe objects only, "and of that preciſe period of time which fall under its cognizance: hence, (ſays he) though the

“ bread which I formerly ate nouriſhed me, that is, a body of ſuch ſenſible qualities was at that time endued with ſuch ſecret powers; it will not follow, that other bread at another time muſt alſo nouriſh me; and that like ſenſible qualities muſt always be attended with like ſecret powers? The conſequences ſeem no way neceſſary: at leaſt it muſt be acknowledged, that there is here a conſequence drawn by the mind, and a certain ſtep taken, a proceſs of thought, and an inference, which wants to be explained. Theſe two propoſitions are far from being the ſame. I have found an object has always been followed by ſuch an effect, and I foreſee that other objects which are in appearance ſimilar, will be followed by ſimilar effects.” He afterwards adds, “ I ſhall allow, if you pleaſe, that the one propoſition may be juſtly inferred from the other; I know in fact that it is always inferred; but if you inſiſt that the inference is made by a chain of reaſoning, I deſire you to produce that reaſoning. The connection betwixt theſe propoſitions is not intuitive: there is required a medium which may enable the mind to draw ſuch an inference, if indeed it may be drawn by reaſoning and argument.” In oppoſition to Mr Hume, I contend, that the inference is made by a chain of reaſoning, and we are at no loſs for a medium to connect the chain. The ſame cauſes will always produce the ſame effects; becauſe matter is unchangeable. This unchangeability is the medium by which we are enabled to draw the inference; it is the foundation on which the reaſoning is built, and its force is irreſiſtible. It is as undeniable as any propoſition can be. He himſelf confeſſes, that we always do infer the effect from the cauſe, and it is impoſſible we can do otherwiſe, as the unchangeability of matter is ſo firmly impreſſed upon our minds, that whatever we may pretend, we always do and muſt rely upon it.

Again, we can no more deny thoſe facts which are derived from the evidence of our ſenſes, than we can deny the truth of any ſelf-evident mathematical propoſition. Much has been ſaid about the fallacy of our ſenſes: they have been repreſented as ſo deluſive as to be totally unfit for being held as a ſtandard of truth; but all attempts of this kind muſt ever prove abortive. Experience has indeed taught us, that the perception of objects we receive by the ſenſes of ſight and hearing are not always correct; but they never lead to believe that we ſee when we do not ſee, or that we hear when we do not hear. We ſoon learn to know, that the difference betwixt the apparent and real appearance and ſituation of objects does not ariſe from any fallacy or inaccuracy in the ſenſes, more than from any change in the material object, but from the difference of circumſtances under which we receive the perceptions. In the ſame circumſtances, all the ſenſes uniformly give the ſame teſtimony; but when communications are made to them through different media, or by irregular approaches, they would be inaccurate if they did not give different reſults. Theſe variations, ſo far from ſhewing that the ſenſes are fallacious, give the moſt convincing proofs of their accuracy; and ſo far from proving that experience is not to be relied on, they manifeſtly determine it to be our ſureſt guide. It has been contended, that in ſome caſes of mental derangement the ſenſes are deceived, and the perſon imagines he percieves things which have no exiſtence; but this deception does not ariſe from the ſenſes, but from the mind. The ſenſes give no falſe report: the thing is impoſſible, becauſe they never act but when acted upon. If no ſuch action takes place, they give no falſe report, as they give none at all. The mind is much more liable to diſorder than the ſenſes; and though in a ſtate of mental derangement the perſon imagines he perceives things which have no exiſtence, it is evident that the deception is in the mind, and not in the ſenſes. In all ſuch caſes, I believe, it will be found, that the perſon is liable to deception in other things, as well as concerning the report of the ſenſes, and that at times he is no more able to determine the truth of a mathematical demonſtration, than to draw inferences from matter of fact; nor do I doubt, that he will pervert the principles of geometry as much as he does the evidence of his ſenſes.

It is clear from theſe conſiderations, that there is no ſpecies of evidence ſuperior to that which ariſes from ſenſe and experience, and that we may rely with as much confidence upon the report of the ſenſes modified by experience, as we can do upon the ſcience of quantity, or the relation of numbers. In ſhort the claims of both are ſo equally balanced, that I ſhall not pretend to determine the preference. A ſimple fact is more eaſily comprehended than a complex mathematical queſtion; and as the mind is always beſt ſatisfied with what it underſtands beſt, it will in this caſe yield the readieſt aſſent to the experimental fact. On the other hand, a ſelf-evident propoſition is ſooner comprehended than a long chain of evidence, and it is eaſier to draw the concluſion from a plain demonſtration than from a number of facts of contradictory appearances; the readieſt aſſent will therefore be given to the ſelf-evident axiom and the mathematical demonſtration. But ſuch differences as thoſe ariſing only from the particular nature of the caſe, are not ſufficient to decide betwixt their general characters, or to determine the queſtion of ſuperiority. If it were to be decided by the force of the impreſſion which each of them makes upon the mind, I have no doubt but the preference muſt be given to the evidence which ariſes from ſenſe, as it is generally the ſtrongeſt and moſt laſting; but as both kinds are undeniably certain, the attempt to determine a preference would be abſurd.

I have been induced to examine the arguments of Hume rather becauſe they have a tendency to check philoſophical ſpeculation, than from any dread of their influence upon human action. He indeed ſeems aware of their tendency, and comforts himſelf with the conſideration, "That nature will ever prevail over abſtract reaſoning." But why make an attempt of ſo injurious a nature? Why kindle up a war betwixt philoſophical inveſtigation and natural impreſſions? Why envelop the principles on which human action depends in ſuch a miſt, that we cannot ſee through it? Such an attempt is not only uſeleſs but dangerous. Although it may be incapable of changing that powerful impulſe which impels men to action, it may do incalculable miſchief, by checking the progreſs of inveſtigation. It has, perhaps, already prevented many young philoſophers from venturing where ſuch an aged inquirer has declared the bottom to be unſafe, and where he could only wade in deep water and uncertainty. Thanks to our Maker, it is not poſſible for us diſcredit the teſtiſtimony of our ſenſes, or to believe that paſt experience is no guide for the future: for if this were the caſe, in what a wretched ſtate ſhould we be placed! Without knowing where we are or how to proceed, we ſhould never fulfil the great purpoſes of life, or arrive at that ſtate of perfection of which our nature is capable. The ſtate of mind which muſt ariſe from ſuch a ſituation would break the ſprings of human action, it would take from us the compaſs by which alone we can ſteer; and we ſhould infallibly be loſt in the wide ocean of uncertainty.

I confeſs myſelf very unfond of ſcepticiſm, becauſe, from its nature, it has a tendency to embecilitate the mind. Inſtead of enlarging our expeperience, it ſinks us into a ſtate of lethargy and degeneracy: inſtead of guarding us from error, it prevents that inquiry by which the progreſs of error is ſtopt. Scepticiſm is the giving up of all hope; it makes us either to ſit down in fretful diſappointment, or fall aſleep in unſatisfactory indolence. The man who has a fixed opinion, even although it ſhould be wrong, has ſtill the ſatisfaction of believing himſelf right: but he who is ſceptical can never have this enjoyment; he cannot, on rational grounds, reſt himſelf contented and happy. If he thinks at all upon the ſubject, he is perplexed by his incapacity, and mortified by his ignorance.

There is no doubt that human knowledge muſt have limits, and there is a certain point beyond which it cannot go; but uncertainty in that which is utterly beyond our reach, is very different from ſcepticiſm and doubt upon the accuracy of natural impreſſions, and concerning the principles of human action. If the Deity has not unfolded every thing to us he has at leaſt given us juſt impreſſions of external objects, and of the principles of moral juſtice. He has eſtabliſhed the principles upon which human action depends, on ſuch a foundation, that reaſon and experience unite in its ſupport.

# NOTE

## *On Mr* LESLIE'S *Inquiry into the Nature and Propagation of Heat.*

WHEN the foregoing ſheets were copying for the preſs, I obtained a ſight of Mr Leslie's Inquiry into the nature and propagation of Heat.

His experiments ſeem to have been very ingeniouſly conducted, and he poſſeſſes eminent mathematical ſkill. I cannot, however, admit the concluſion he draws reſpecting the identity of light and heat. Independent of the difference betwixt their chemical effects, which he is unable to reconcile, the characters of heat and light are as oppoſite as any two things can be. The former is entirely a homogeneous body, as far as has been diſcovered by its effects: the latter is compoſed of different varieties, which put on diſtinct appearances, and are found to poſſeſs different chemical powers. The firſt has an attraction for all matter indiſcriminately, and a repulſion to none: the laſt diſcovers objects only by its repulſions or reflections. The motion of the one is uniformly ſwift, and always proceeds in ſtraight lines: but the motion of the other appears to be irregular, and it paſſes equally by the bended tube as the ſtraight line. Light has only the capacity of paſſing through a certain claſs of bodies, which it performs with equal velocity as through void ſpace: heat paſſes through all bodies, but with very different degrees of motion; ſometimes with extreme ſlowneſs.

It is impoſſible that heat ſhould be light in a ſtate of combination; for in this ſtate it produces no heat at all. What a vaſt accumulation of the particles of light are combined in a candle; yet it has not the ſmalleſt degree of ſenſible heat till it be lighted. When this takes place, the heat appears along with the light; becauſe, on the diſſolution of the combination, theſe powers are ſet at liberty, and brought into action. We have deciſive proof that caloric becomes inſenſible in the combined ſtate as well as light: this takes place when ſolids are changed into fluids, and fluids into vapour.

Theſe facts render it evident, that it is only in the free ſtate that caloric produces heat; it cannot, therefore, be light combined. All matter in a ſtate of combination is incapable of forming new connections, till the former are diſſolved; but we are certain that caloric in the ſtate of heat is poſſeſſed of an unlimited power of action: it is capable of uniting with all bodies, and of producing among them an equality of temperature. This is utterly oppoſite to the idea of combination. How is it poſſible that light in its free ſtate ſhould have particular elections, yet in the combined ſtate be poſſeſſed of general attractions in all caſes?—a change of character which defies human belief: it is altogether beyond the bounds of probability. It is inconceivable that light ſhould not produce the leaſt perceptible heat in the eye, when its powers are concentrated upon the optic nerve, and forced, as it were, to dwell upon it, yet that two or three degrees of heat ſhould become ſenſible on every other part of the body, although poſſeſſed of leſs ſenſibility. It is more probable, that the heat which is tranſported by light in its approach to the eye, is in a great degree excluded by the vitreous and aqueous fluids which incircle the optic nerve.

His calculation of the increaſe of heat on the principle of accumulation is below every idea of probability. The ſcale of increaſe is below what experience warrants; and he very erroneouſly ſuppoſes, that the whole ſolid content of the globe would be equally heated by the ſun's rays, without recollecting that it would firſt heat the ſurface, even to liquefaction, before it deſcended to the centre, as is clear from the melting of metals, and even by digging into the earth at the time of the greateſt heats.

I know not that we have any certain data whereby to calculate the accumulation of heat by the ſun's rays in one ſeaſon. We have, however, experimental evidence of this accumulation in the countries bordering on the frigid zones. In Ice-land the thermometer has been known to ſink to 24° below the freezing point in winter, and to riſe to 104° in ſummer. On the principle of accumulation by the ſun's rays, the quantity of heat diſtributed ſhould always be nearly equal, becauſe the earth's attraction is always the ſame. We might therefore be warranted in taking the higheſt ſcale of calculation, and to conſider the loweſt as being occaſioned by accidental and temporary circumſtances, which courſe of time would be continually diminiſhing: but though we ſhould take a medium, and conſider the accumulation in the courſe of a year to be only 90° or even 60°, how ſoon would this melt the ſurface of the globe!

I am ſenſible that the great length of the day in high latitudes gives the ſun more than the proportional power in ſummer; but we muſt alſo obſerve, that the oblique rays which fall in theſe latitudes are found to be not ſo powerful in producing heat as the perpendicular rays of the torrid zone, ſo that a greater quantity is there accumulated in a ſhorter time; and that it is not ſo experienced muſt be owing to the abſolute loſs of heat, either by leaving the earth altogether or by changing its character.

## CHAP. II.

# OF THE DEITY.

### Sect. I.

*Of the Exiſtence of the Deity.*

MOST men, I believe, at ſome period of their lives have been affected by the beauty and order which prevail in the ſyſtem of nature. They have alſo probably been impreſſed with thoſe characters of deſign and contrivance which are ſo apparent, and have been led to aſk themſelves, how theſe thing were produced. It is mortifying to human reaſon to conſider that men are ſtill divided upon a queſtion of ſuch general intereſt as this,—Whether that order which we perceive were produced by an intelligent being, or not? It proves that either the deciſion of the queſtion is altogether beyond our reach, or that ſome ſtrong prejudices have hitherto prevented men from giving full weight to its evidence. If we believe that the queſtion is determinable, it ought to be our aim to diſcover the cauſes of this prejudice, which has operated ſo powerfully, as to prevent many from receiving an opinion ſo powerfully ſupported by the character of nature's works, and, I may add, ſo deſirable by a rational being.

I propoſe firſt to examine the queſtion concerning the exiſtence, and ſecondly, concerning the character of the Deity; in the hope that in the courſe of the inquiry, we ſhall be able to diſcover the ſource of this prejudice againſt the belief of the exiſtence of a Supreme Being.

In early ages, accident was much employed in the ſervice of atheiſm: but the ſyſtem of nature preſents ſo many ſtriking characters of method and deſign, that this plea was found altogether indefenſible. It has accordingly been generally abandoned, and the prevailing hypotheſis among philoſophers of this claſs now is, that all things have been produced by thoſe neceſſary laws by which the different powers are governed in their operations. [illegible] thus expreſſes it: "All the productions of nature are neceſſary, and always the effect of blind Neceſſity." Neceſſity, as thus repreſented, appears like Archimedes with his lever, threatening to overturn the globe, and to extirpate intelligence as well as accident from the univerſe. The natural apprehenſions of men have, however, always been diſpoſed to acknowledge the right of ſome other Powers in the government of the ſyſtem of nature. I freely confeſs that I pay ſo much regard to natural apprehenſions, that I would judge it very imprudent to confer upon neceſſity unlimited power, before we examine the claims of her two rival canditates.

On mentioning the word *accident*, I am ſenſible I enter upon controverted ground; but a zealous inquirer muſt not be ſtartled at appearances, nor adopt opinions merely becauſe they are prevalent, leſt, like the affrighted traveller under the gloom of night, miſtaking a bundle of ſtraw upon his road for the dead body of a man, or the whiſtling of the wind for the approach of a ghoſt, he ſhould return and loſs the object of his journey. On examination it will be found, that the word *accident* has no chimerical exiſtence, conveys as plain a meaning as any in our language, and that ſo far from being an improper term, it would be impoſſible for us to expreſs our ideas without it.

I premiſe, that there is an eſſential difference betwixt events which ariſe from one and the ſame cauſe, and thoſe which ariſe from different cauſes that have no connection or relation together, and are brought into colliſion only by ſome ſeparate cauſe, or unforeſeen circumſtance. The firſt ſort of events is unchangeable in their nature, and may be ſaid to ariſe from a natural neceſſity. The ſecond are variable, depending often upon time, circumſtances, and other cauſes which have no relation together. Theſe can, with no propriety of language, be called neceſſary; they are ſtrictly accidental.

If the reader ſhould wiſh the ſubject examplified, it is only neceſſary to obſerve, that all the laws and properties of matter are ſtrictly and truly neceſſary, but that its combinations are not ſo in the ſame ſenſe of the word. The laws and properties of matter are as unchangeable as its exiſtence, becauſe they are inherent in the original particles; but its combinations are often temporary, and always liable to change, becauſe they depend upon time, circumſtances, &c. The change of combination does not change the nature of matter; it is ſtill the ſame in all ſtates, whether combined or not. It, indeed, by a change of combination, puts on new appearances, and diſcovers new properties; but it does not acquire theſe, neither do they change its nature: it is ſtill the ſame matter, and when that combination is diſſolved, it will appear the ſame as before. The change of combination does not implant new properties, it only calls them forth into action.

I readily admit that all the powers of matter are truly and ſtrictly neceſſary, and that they can never act but by the laws of their exiſtence. Theſe are therefore abſolutely and invariably neceſſary, and can never be changed. But allowing this to be the caſe, ſtill there is no natural or neceſſary connection betwixt time and circumſtances and the material powers; theſe are the ſame in all circumſtances and at all times. On the other hand, whatever is capable of variation, or whoſe exiſtence depends as much upon the time and circumſtances on which the material powers happened to meet as upon their nature and character, can never be ſaid to poſſeſs a neceſſary exiſtence. It is plainly diſtinguiſhed from the firſt ſort of exiſtence; becauſe this might either have exiſted or not if the circumſtances had been different: whereas the other is the ſame in all circumſtances whatſoever. What then is the exiſtence which they poſſeſs? If it be not a neceſſary, it muſt be an accidental exiſtence; becauſethe theſe being two oppoſites, which admit of no middle ſtate, if it be not the one it muſt be the other. Combination cannot be neceſſary to the material powers, for they exiſt independent of all combination; and if it be not neceſſary to them, it is plain that it muſt be accidental. There is no combination which can exiſt at all times and in all circumſtances. Many of them take place under very limited circumſtances; even water, perhaps the moſt abundant body in the globe, can only exiſt in the fluid ſtate under very limited degrees of heat. To produce combination, it requires time and circumſtances to co-operate with the material powers; but as the meeting of theſe is not naturally neceſſary, it muſt be accidental.

What is meant by accident, but the meeting of two things which had no previous connection, and which were not brought together by the ſame but by different cauſes, entirely unconnected and independent of each other. Thus, two clouds coming from different quarters of the heavens, accidentally meet and unite. Let us mark what is accidental and what is neceſſary. Their meeting is accidental, becauſe they had no previous connection, and were not drawn together by one and the ſame power, but by different cauſes entirely independent of each other. If the direction of the wind which carried the one cloud had been a little more to a ſide, they would have paſſed by each other without coming in contact. Or ſuppoſing them to come from croſs quarters, if they had not both come to the place of meeting preciſely at the ſame moment of time, they would alſo have miſſed each other; and that in this caſe they did not actually meet was owing to an union of time and circumſtances; which, as they had no previous connection, and their meeting not being produced by the ſame cauſes, cannot with any propriety be called neceſſary. It is not contended, that the motion of either of theſe clouds took place without a cauſe; this would be an abſurdity; but, as they had no previous connection, it is impoſſible that the cauſe of the one's motion ſhould have produced the other's. Their combination, therefore, took place in conſequence of three different cauſes, time, place, and the action of material powers, which we have ſhewn to have no neceſſary connection; conſequently their meeting muſt have been entirely accidental.

Having ſhewn what is accidental, let us now take notice of what is neceſſary. Though theſe clouds did not meet by any natural neceſſity, but by accident, yet when they approached within a certain diſtance, they muſt, in conſequence of a particular law, have attracted each other, and united. This is ſtrictly and truly neceſſary. It muſt, hower, be obſerved, that it was not this particular law which brought theſe bodies within the ſphere of each other's attraction. It was cauſes which were totally independent of each other, conſequently not neceſſary. Accordingly we ſee clearly what was accidental and what was neceſſary. The connection of one thing with another can never be neceſſary, except where the one immediately influences the other; and as the approach of the two clouds was not cauſed by each other's attraction, it could not be neceſſary; but after having met, all the conſequences which followed from their union became neceſſary. Thus if a quantity of electric fire is incloſed by the union of theſe clouds, and an exploſion produced, the ex-

[illegible] which falls pu [illegible] produces a good cro [illegible]; all this is neceſſar [illegible] of neceſſary cauſes very o [illegible] accidental one.

[illegible] equally predominant in th [illegible] phyſical world. Two men, com [illegible] of the country, happen t [illegible] they converſe, and the one learn [illegible] to a diſtant town in ſearc [illegible] want of a ſervant, is plea [illegible] appearance and converſatio [illegible] the other afterward [illegible] his daughter, and inherit [illegible] to every one, wha [illegible] was neceſſary. Th [illegible] accidental: a half hour's diffe [illegible] have prevented it; the [illegible] but hav [illegible] might have been i [illegible] converſed on th [illegible] on the ſubjec [illegible] ſervice [illegible] ſervant, but no [illegible] appearance. A [illegible] accidental; that is, th [illegible] of th [illegible] cauſe o [illegible] differen [illegible] together. The introduction, converſation, and agreement, were not naturally neceſſary, according to the firſt diſtinction, but only accidentally ſo, according to the ſecond. Mark the difference betwixt accident and neceſſity. The young man's accompliſhments gain the affections of his maſter's daughter; his ſteady attention to buſineſs, and his ſaving the old man's life, gain his confidence and eſteem. All this was naturally neceſſary, becauſe the one produced the other. The difference betwixt the two caſes is plain and obvious. Wherein does it lie? It lies in this—the one ariſes naturally and neceſſarily from the ſame cauſes; the other does not, but is produced by different cauſes entirely unconnected, and therefore can with no propriety be ſaid to ariſe from it neceſſarily, or to be neceſſarily connected with it.

A hundred caſes might be ſtated to illuſtrate the ſubject; and it will be found, that accident has as firm an eſtabliſhment in men's minds as the doctrine of neceſſary cauſes; and the prudent man no more fails to guard againſt accidents, than to take advantage of the neceſſary and invariable laws of nature. Men will always be liable to impute to accident whatever does not naturally ariſe from the circumſtances of the caſe; in other words, what could not be foreſeen. Learned men may baniſh the word accident from their writings; but they will never be able to eradicate the idea from their own and other men's minds. But though it were poſſible to deſtroy the very idea, ſtill that would not alter the nature of things. You can never conceive that the irregular jolting of oppoſite cauſes is ſimilar in its nature to the regular and known effects which ariſe from the ſame power. The latter is like the eaſy glide of a river by a regular deſcent, which the eye delights to follow, becauſe it knows its courſe: the former is like the abrupt raiſing of water by a hydroſtatic machine, which excites ſurpriſe and wonder in the mind of a traveller who has never ſeen the like. The raiſing of the water in this caſe is not produced in conſequence of the neceſſary laws of nature: on the contrary it is rather an interruption of theſe laws: it is placed in a ſituation which it never could have reached in conſequence of theſe, and when they are again allowed to operate, the water thus raiſed will again deſcend till it finds its level. The firſt occurrence which raiſed the man from a ſtate of ſervitude to that of independence was produced by accident; the raiſing of the water was produced by deſign: but they are both equally deviations from the laws of neceſſity. By allowing a place to accident, no man of common ſenſe will draw the concluſion, that any thing will happen without a cauſe. There is nothing which can poſſibly take place without a cauſe, whether by accident or otherwiſe. An accident is really a cauſe, as much as if it were produced by deſign, or by any neceſſary law whatever.

How fanciful and ridiculous are the doctrines of ſome learned and otherwiſe reſpectable men upon this ſubject. Some one, I forget who, maintains, that if only one pin were ſhifted out of its place, it would derange the whole univerſe. But as in the natural world, thouſands of waves ariſe from the ſea, carrying millions of particles of ſand along with them, and depoſiting them in another place, without altering the boundaries of the water one inch; ſo among men, thouſands of indifferent actions are performed and words ſpoken, which although neither had been done, would have been replaced by others equally indifferent, without in the leaſt altering the circumſtances of men. It is fortunate for man, that the ſcales are not ſo nicely balanced, elſe his actions would long ſince have deranged, and conſequently deſtroyed, the whole ſyſtem of the univerſe. The folly of this philoſopher with the ſhifting of his pin, can only be equalled by another, who makes an aſs to ſtarve between two bundles of hay of equal quality and quantity, and at the ſame diſtance.—The reader will pardon this diſcuſſion, as it will be found neither uſeleſs nor unneceſſary in enabling us to determine the main point of our inquiry. It is neceſſary to diſcover the true character of this deſpot neceſſity, which is cloathed with unlimited power, [illegible] and to direct every [illegible] whether it be the ſole [illegible] of the univerſe.

[illegible] that there are other two [illegible] intelligence, who have [illegible] and as each of their works [illegible] diſtinct characters whereby [illegible] it will be proper to point [illegible] proceed any further.

[illegible] character of *neceſſity* is an [illegible] The name and the very [illegible] would lead us to form this [illegible] its character; becauſe any [illegible] be changed or ſuperſeded can [illegible] any law of neceſſity. If [illegible] acting be neceſſary, another [illegible] mode cannot alſo be neceſſary. [illegible] neceſſity permits no contrarie- [illegible] be neceſſary, another oppoſite [illegible] The neceſſity of the one caſe [illegible] as a law to act, and an- [illegible] ſame circumſtances, is [illegible] If we conſider the ſubject in a [illegible] this character of neceſſity [illegible] appears [illegible] only phyſical neceſſity [illegible] connected [illegible] ſubject. All the laws [illegible] will be found as unalterable as they are [illegible]; and it is as impoſſible to change their mode of acting as their exiſtence: they are indeed ſtrictly and truly neceſſary: Amidſt the innumerable changes which matter is continually undergoing, we find that it never loſes its powers or changes its character. Fire neceſſarily produces heat, ſmoke neceſſarily aſcends, and light neceſſarily proceeds in ſtraight lines. The ſame kind of light will always reflect the ſame colour, and the magnet will always attract iron. Even the very ſame meaſures and degrees of material action will uniformly produce the ſame effects: 32° of heat will always melt ice, 212° will boil water; and the force of attraction is uniformly as the ſquare of the diſtance between the attracting bodies.

It is evident from theſe facts, and numerous others that could be adduced, that wherever we find varieties in the mode of operation, theſe can never be imputed to the laws of neceſſity. Hence we may always be ſure that if ſmoke deſcends, it is forced down by a current of air; if light is turned out of its ſtraight courſe, it has either ſuffered a refraction or a reflection: theſe are things accidental, which have no claim to the character of neceſſity. All the ſervants of neceſſity are neceſſarily tied down to their taſk, and can in no caſe whatever deviate from their duty. If it were poſſible for any of them to change their mode of operation, the neceſſity of their nature would be deſtroyed, and they no longer could act in that capacity. Neceſſity is truly a regular government:

it is ſtrictly juſt and impartial, but unaccomodating to the laſt degree: it is as incapable of beſtowing favour as of doing injuſtice.

*Accident* may rather be called a triple directory than a ſingle power, as it always requires that time and circumſtances ſhould co-operate with ſome active power. Its character is the very oppoſite of neceſſity: it is equally incapable of a regular plan of acting, as the other is of changing: it is only capable of making inroads upon the territories of its neighbours, but can make no permanent ſettlement for itſelf. It is continually diſturbing the regular order which the laws of neceſſity produce, and thwarting the deſigns of intelligent beings. It ſometimes makes terrible devaſtations, and produces very numerous innovations. The beſt laid plains and the moſt cunning deſigns are often fruſtrated by this active and irregular foe, as its attacks are often made from a quarter where they are leaſt expected. Intelligence can in part guard againſt its incroachments, but neceſſity is its conſtant prey. It is this irregularity and inconſtancy that conſtitutes the great characteriſtic of accident; and by this its actions may always be known. Its character is indeed ſo very unlike that of the other two powers, that it requires no application to diſcover, no penetration to diſtinguiſh it: the moſt ignorant and ruſtic, the raweſt youth, can tell what is an accident, as well as the graveſt philoſopher.

*Intelligence* is alſo poſſeſſed of very diſtinguiſhing characters, by which it may be known; and if it is not the moſt general agent in nature, it has at leaſt the moſt extenſive powers for governing. Perhaps it ought not ſo much to be looked upon as a rival to neceſſity, as its colleague in the government of the univerſe. All the laws of material action are wholly under the government of neceſſity: theſe intelligence never attempts to change; it only directs their operations into ſuch channels as are calculated to accompliſh the ends it has in view. As it finds them faithful ſervants, it places that reliance upon them which their fidelity, and the unchangeabilty of their character ſo fully warrant.

The grand characteriſtics of intelligence are Contrivance and Deſign. Theſe are properties which as excluſively belong to it as figure and magnitude do to body. If, therefore, in our inquiries we find undoubted proofs of the exiſtence of theſe properties in the works of nature, we may certainly conclude theſe works to be its productions; and we are obliged, by every law of equity, and every rule of reaſoning, to aſſign to it a chief rank and ſtation among the governing powers.

Having now ſhewn that neceſſity has not at leaſt an indiſputed claim to abſolute ſovereignty, the object of our inquiry now is, to diſcover what ſtamp the works of nature bear, whether neceſſity and accident are ſufficient to account for all that variety, beauty, and order which we perceive; or whether we are not obliged to have recourſe to a Supreme Intelligence or Deity, as the prime agent in the production of theſe excellencies.

The exiſtence of the Deity, it muſt be acknowledged, is not a thing ſelf-evident. Were this the caſe, no reaſoning would be required to eſtabliſh it. But ſo great is the force of its evidence, that I am at a loſs to conceive how any man can contemplate the face of nature, without being impreſſed with the idea that it has been framed by intelligence. If the atheiſt is juſtifiable in believing, that an immaterial being can never be the creator of material things, why does he adopt a principle exactly ſimilar? There is certainly as much difficulty in ſuppoſing, that that which is unintelligent can produce intelligence, as that mind ſhould produce matter. Here, as in every thing elſe, nothing can produce nothing, and no ſubſtance can communicate what it does not poſſeſs. Inſenſibility can no more produce ſenſibility, than darkneſs can produce light. It is undeniable, that man is an animated and intelligent being. Who gave him that animation? who produced that intelligence? Something, it muſt have been, that poſſeſſes both. There can be no greater abſurdithan to ſuppoſe an unintelligent ſubſtance to be the author or ſource of an intelligent mind. The cauſe is inadequate to the effect; nay, the effect in this caſe, is greater than the cauſe. It is of much importance to attend to this, as it is impoſſible for the atheiſt to do away the force of the reaſoning. It is evident that the very principle on which he rejects the creation of matter is fatal to his own hypotheſis; and he muſt either abandon this principle or admit the concluſion that intelligence neceſſarily exiſts.

Although all materialiſts are not atheiſts, all atheiſts are materialiſts. I would therefore aſk the atheiſt, If the combination of a ſmall quantity of matter, ſuch as occurs in man, produce an inferior intelligence, why may not the combination of a large quantity produce a greater intelligence? Again, if a ſmall quantity produce an imperfect, may not the whole of matter produce a perfect intelligence? It is impoſſible to found a concluſive argument againſt the exiſtence of a Deity on the principles of materialiſm; for if we adopt the opinion of its capacity on a ſmall ſcale, on what principle can we reject it on a large? If a proportion of matter can, by its own powers, become animated on any ſcale, the vaſt variety of its powers renders it impoſſible to ſet limits to its capacities, or to ſay to what degrees theſe when united may not reach. The exiſtence of the power in an inferior degree, muſt lay a foundation for ſuppoſing it in the higheſt degree.

This reaſoning may be objected to on the ground of its granting too much to materialiſm; but it can never be dangerous to combat atheiſm with its own weapons. Truth can never be the cauſe of error; and the unprejudiced inquirer is never afraid to draw obvious inferences from known facts. I ſhall, therefore, undiſmayed, draw the concluſion from the argument. The object of diſpute at preſent is not concerning the character, but concerning the exiſtence of the Deity. It is undeniable that the exiſtence of intelligence in man, even on the ſuppoſition that he is wholly material, lays a foundation for the belief of a Superior Intelligence. It deſtroys the preſumption which may be ſuppoſed to ariſe from the principles of materialiſm, and the character of inanimate matter; and if we can afterwards ſhew, that the higheſt degrees of active power and intelligence are as neceſſary to account for the works of nature as the inferior degrees of it are neceſſary to account for the works of man, the proof muſt be reckoned in all reſpects complete.

It will perhaps be contended, that animation and intelligence ariſe wholly from organization, and therefore there can be neither animation nor intelligence where this does not exiſt. But organization produces no new power; it only places thoſe already exiſting in the moſt favourable circumſtances for action. Form, indeed, increaſes mechanical force; but it cannot be ſhewn that there is any relation betwixt animation and mechanical force, as the latter is equally powerful in the dead as in the living machine. It is evident, that animation has no dependence whatever on mere form, as we find that it exiſts in a vaſt variety of different creatures of very different forms and characters; and, although it were poſſible to make the form of a man or a horſe, with both their external and internal parts, would this infuſe the ſpirit of animation? Animation, any more than chemical power, can never be the creature of form, or any particular mode of exiſtence. It muſt be derived from ſomething originally inherent in theſe bodies or beings which poſſeſs it. It is not my preſent buſineſs to inquire what is the nature of this animating principle. This ſubject is of too much importance to be ſlightly paſſed over; it muſt therefore have a chapter reſerved for itſelf; but in the mean time let it be obſerved, that its pre-eminence and ſuperior character are evidently ſo great, that we muſt aſſign to it the firſt place and chief rank in the ſcale of being.

It has been ſhewn, that the natural tendency of all material action is to produce a ſtate of reſt, and that no one kind of matter is poſſeſſed of an original and inherent power of acting by itſelf; it cannot, therefore, be the author of conſtant activity and perpetual motion. It has in itſelf no principle capable of maintaining this regular and conſtant action. A tendency to produce a ſtate of reſt is altogether inconſiſtent with the idea of the capacity of perpetual action. The one character cannot conſiſt with the other. Matter muſt derive this ſpring of action from ſomething beſides itſelf. It evidently owes its continual and regular action to arrangement, to a deſigned plan, and in animals to ſome principle of volition exiſting in themſelves. How can that matter which wants the capacity to direct its own action, be the director of all that regularity, order, and beauty which prevail in nature? How can thoſe laws which, from their nature, are unchangeable in all their modes of acting, produce all the varieties we ſee? We can eaſily believe that matter may poſſeſs unknown properties, but we can never believe that it can poſſeſs any that are in their nature directly oppoſite to thoſe that are known. The nature of mind is in this reſpect very different from that of matter. It is not like it confined to an invariable mode of acting, but in ſome circumſtances it can either act or not act, can purſue the ſame courſe or take a different one. The fire can never refuſe to give out its heat, nor the metals to melt when it is applied to them; but when meat is ſet before a man, he may either eat or not eat; he can walk or not walk as he pleaſes; becauſe he is not, in the ſame degree, under the laws of neceſſity as inanimate matter.

The grand diſtinction betwixt matter and mind is this;—The one acts neceſſarily, and without choice; the other voluntarily, and with deſign. If it could be ſhewn that matter is poſſeſſed of a diſcriminating and voluntary power of action, that in the ſame circumſtances it can act or not act, I ſhould yield the point to materialiſm, though not, without further inquiry, to atheiſm; but there is ſomething in the nature of mind which matter does not ſeem poſſeſſed of, nay, ſeems incapable of poſſeſſing: and until this difficulty is removed, until it can be ſhewn, that ſome part of matter is at leaſt different from the reſt, we muſt continue our inquiries.

We are not to expect that the evidence of contrivance and deſign is to be found throughout every part of nature; but ſo far is this from weakening the argument, that in my opinion, the evidence is thereby rendered the more ſtriking. If all the forms of matter had exhibited the ſame characters of order and deſign, the atheiſt would have had ſome reaſon to contend for their being prduced by the laws of matter, and that the material powers could act no otherwiſe: but all pretenſions of this nature are invalidated by the limitation of theſe characters to certain parts of nature's works. In theſe parts, however, there is a ſuperabundance of proof, and the hand of intelligence is clearly recognized.

Notwithſtanding the great diſtance of the planets from each other, as well as from the ſun, we can perceive ſuch a beautiful arrangement, as to impreſs our minds very ſtrongly with the belief of deſign. In this arrangement there are evidences of conſummate ſkill and wiſdom; as well as of inconceivable power and greatneſs. Let it be recollected, that theſe vaſt bodies move round the ſun as a centre, and are preſerved in their orbits by the exact balance of oppoſite forces; and, as has been already obſerved, it is impoſſible to conceive how original impulſe could have been communicated to one of theſe forces in the direction in which it moves, except by a deſigning power. This balance requires the ſize and velocity of the planet to be ſo exactly adjuſted, as that none of the oppoſite forces can prevail; for if this were to take place, the inevitable conſequence would be the deſtruction of the whole ſyſtem. Not only would that beautiful action, arrangement, and order, which adorn the planetary bodies be deſtroyed, but the whole motion of the univerſe would ceaſe, and all matter be locked up by the hard gripe of attraction, never more to quit its hold. On the other hand, if the centrifugal force ſhould prevail, in a very little time the planetary bodies would be ſo far ſcattered in the immenſe regions of ſpace, as to be deprived of a ſufficient ſupply of the ſun's light to ſupport that action and animation which at preſent prevail.

Perhaps this balance of force may be denied; but let thoſe who deny it point out by what other means the planetary bodies are preſerved in their orbits. The exiſtence of the attractive power is incontrovertible. It is felt at the greateſt diſtances, as well as at the earth's ſurface: it acts betwixt the different planets and their ſatellites, as well as betwixt them and the ſun: It creates irregularities in their motions, which are moſt obſervable in Jupiter and Saturn, on account of their ſuperior magnitude. What is it that prevents this mighty power from obtaining abſolute ſovereignty, and from throwing the whole of matter into one maſs? It is evidently prevented by the action of a contrary force, and theſe two forces, by the contrarieties of their action, alternately prevail over each other; but when the advantage is gained by the centripetal or attracting force, the additional velocity acquired by the planet, by an invariable law of motion, adds ſtrength to the centrifugal, and enables it to recover what it had loſt.

It is evident that theſe alternate advantages gained by each power over the other, can only be accounted for on the principle of mechanical ſeen, and explained by the laws of motion. What clearer proof of intelligence and deſign can be found than this? or can any thing be more convincing that the great agent was fully acquainted with the laws by which the heavenly bodies are governed? If the circular motion of the planets were ſolely performed by the action of the material powers, theſe alternate changes could never happen, becauſe material action is always uniform and regular; nor do we know of any one material power which has the capacity to balance the centripetal force. It cannot be a repulſive power, becauſe the direction of its motion is as oppoſite to a repulſive as it is to an attractive force. There is no material power that could act in the direction in which this power acts; and if it is not performed by a material power, it muſt either be done by an original impulſe, communicated by a deſigning agent poſſeſſed of ſufficient power, or by ſome animating principle exiſting in the bodies themſelves. Either of theſe views is utterly ſubverſive of the atheiſtical hypotheſis; for as an original impulſe, ſo wiſely directed and exactly balanced, neceſſarily implies an intelligent agent, ſo in like manner, if it is performed by an animating principle exiſting in the bodies themſelves, it affords a proof that ſuch a power exiſts otherwiſe than by animal organization, conſequently lays a foundation for believing the exiſtence of an intelligent being beſides man; in other words, a Deity.

It has been ſuggeſted that our earth, although attended by continual revolutions and changes, is directed by a principle of order. If this be the caſe, there is equal reaſon to ſuppoſe, that all the other parts of nature are directed by the ſame principle, as the regular courſe by which they are preſerved in their ſeveral orbits makes it evident that they are all governed by the ſame laws. But had they been originally directed by a principle of order, they could never have been ſubject to revolution or alteration. A ſtate of change is not a ſtate of order; nay, an inherent principle of order is contrary to the very idea of revolution and change. And as it is evident that our earth has undergone various changes and revolutions, it cannot be directed by any ſuch principle.

If we turn our eyes from the general ſyſtem of planetary organization, to examine our own earth, we ſhall find the characters of deſign perfectly apparent. The diviſion of time into day and night by the diurnal motion of the globe is admirably adapted to the ſtrength and wants of its inhabitants, and to the nouriſhment of the vegetable creation. The extremes of heat and cold are equally guarded againſt; for if the earth had been either much colder or much hotter, a conſiderably greater part of it would have been rendered uninhabitable. The oblique direction of the earth's axis in her motion round the ſun, affords a longer ſummer for ripening the fruits, and the winter froſts a ſalutary cure for contagious diſorders which ariſe from the ſummer heats. The very irregularities which cover the earth's ſurface are found to be the principal means of collecting the vapours, for its neceſſary ſupply of moiſture. In ſhort, the phyſical conſtitution of the globe, and the character of its inhabitants, have every appearance of being exactly fitted to each other by deſign; and while the inhabitants beautify and adorn its ſurface, it yields them in return all thoſe bleſſings it is capable of producing.

There is reaſon to believe, that the other planetary bodies are repleniſhed, like the earth, with animated beings, and that the conſtitution of their inhabitants is equally adapted to their climate and character. It is vanity to ſuppoſe that the Deity has laviſhed all his care upon our earth, and made every other part of nature ſolely ſubſervient to the ſpot upon which we are placed. But as obſervation renders it evident, that the conſtitution of the inhabitants of theſe bodies muſt be very different from ours, it is to no purpoſe to reaſon upon this ſubject. We muſt therefore leave theſe things as totally inſcrutable. Let us direct our attention to animal and vegetable economy, where the moſt obvious marks of intelligence and deſign are to be found. In theſe wonderful ſyſtems, all that contrivance and ſkill in the planetary organization, too vaſt for our comprehenſion, and too remote for our inſpection, are, as it were, concentrated, and brought near to our view.

Never did any machine made by the hands of men more ſtrikingly diſplay the characters of deſign than the animal frame, and in particular the human body. The depth of contrivance, and the amazing quantity of machinery employed, are altogether aſtoniſhing. Whether we examine its different arts ſeparately, or their mutual connection the evidence is equally ſtrong and convincing. The eye is manifeſtly an optical inſtrument. It is formed on the very ſame principle with inſtruments of that kind made by men; and it excels them all in the variety of its machinery, in its capacity of movement, and command of action. The ear is evidently an inſtrument made for the perception of ſound; and the perfection of its form for this purpoſe, is clearly manifeſted by its powerful effects. In vain would melody try to charm or harmony to pleaſe,—the powers of muſic would be entirely unknown, were it not for the accurate mechaniſm of the ear. The arm is an aſtoniſhing piece of work; the mechaniſm of its parts, the variety of its powers, can never be ſufficiently admired; and the legs are no leſs wonderfully adapted to their appropriate duties. The backbone, in which ſtrength and pliability are wonderfully united, is equally matchleſs. Indeed, all the bones of the body, are evidently adapted to their ſituation and uſe; every joint is exactly fitted for that particular motion, and poſſeſſes that degree of ſtrength, which its office renders neceſſary. The muſcles and tendons alſo ſo exactly correſponding with the form and motion of the joints, give the moſt deciſive evidence that they were purpoſely made to act together.

But we turn our attention from the particular parts, to obſerve the complicated proceſs by which the body is nouriſhed—the mouth, the jaws, the teeth, and the ſaliva, for maſtication, connected by the gullet with the ſtomach, where the food is combined with the gaſtric juice and converted into chyme; after which it is carried into the ſmaller inteſtines, and [illegible] changed into chyle, mixed with the bile, abſorbed by the lacteals, paſſing into the thoracic duct; where it unites with the blood, and then enters into the circulation of the heart; while the whole is carried off by other channels [illegible] prepared for the purpoſe. There is in all this ſuch a connected ſeries of operations, ſuch a variety of machinery, [illegible] without any incumbrance for the ſame purpoſe, that it ſeems to ſet incredulity at defiance. Again, when we conſider the arteries and veins as connected with the heart and lungs, the nerves as connected with the brain, and the careful manner by which all theſe are diſtributed through every part of the body, ſupplying nouriſhment and giving feeling to every part; when we, at the ſame time, conſider the great variety of ſecretions which are performed, and the machinery by which theſe are prepared, our wonder will increaſe. The body is indeed an incomparable machine, in whatever way we view it. What are all the machines ever made by man either for variety of parts, ingenious contrivance, or exact workmanſhip compared to this? How many ages have been employed in ſtudying it, yet it is ſtill imperfectly known; but the more it is known, the more will it be admired; and the more reaſon will there be found to believe that intelligence only could be its author.

I ſhall not attempt an anatomical deſcription of the animal frame, as this of itſelf would require a volume, and as diſtinct treatiſes on anatomy and natural hiſtory are everywhere to be had. It is the more unneceſſary, as a late publication by Dr. Paley has given a very maſterly diſplay of the evidence of deſign and contrivance exhibited in the bodies of animals. To his work, therefore, I refer the reader who wiſhes thoroughly to examine the ſubject.

I ſhall paſs on to inquire, in the firſt place, how far the capacities of the material powers are adapted to produce the ſeparate parts of animals; 2dly, To unite the different parts together in the order in which they exiſt; 3dly, To produce the inſtincts and paſſions of animals; and, 4thly, The varieties of animals. In this inquiry, I ſhall touch upon the anatomical part no further than is neceſſary to illuſtrate the ſubject.

We are, in the firſt place, to examine how far the capacities of the material powers are adapted to produce the different parts of animals.

Matter poſſeſſes innumerable properties which are neceſſary and unchangeable, but is ſubject to few neceſſary forms. In moſt caſes, it ſeems indifferent to all form, and you may impoſe upon it what configuration and ſhape you pleaſe. This flexibility as to form is the foundation of many of the mechanic arts, and it is this that renders it ſo fit an aſſociate for mind in the ſcale of being. Never were two things better adapted for each other than mind and matter. It is the character of mind to direct, and of matter to be directed. The one has the capacity to work, the other to be wrought upon. I do not deny that the Deity, in the formation of the animal ſyſtems, works by means of the material powers: they are indeed employed, and every thing is performed by their means: but they are evidently directed in channels ſo very different from the ordinary courſe of material action, and with ſo many characters of deſign written upon them, that we are neceſſarily led to believe them to be the reſult of intelligence.

I know no neceſſary and invariable forms that are produced by material action, excepting the level ſurface of fluids, and the different kinds of cryſtallization including baſaltes. All the other forms which matter aſſumes can in no ſenſe be called neceſſary; but are either produced by accidental circumſtances, or the hand of a deſigning being. It is even doubtful if either the level ſurface of fluids or cryſtallization be produced by any inherent principle in the combining powers. The level ſurface of fluids evidently ariſes from a deficiency in the adheſive power. The law of gravitation, being ſuperior to it, cauſes its parts to ſhift till they are equally balanced, thus producing an exact level; and if (as has been ſuppoſed by Bergman,) the forms of cryſtals ariſe from varieties in the original elements of which they are compoſed, the combining powers of matter have no capacity to produce any form at all, but are perfectly paſſive in this reſpect, ſubmitting to whatſoever is impoſed upon them. But whatever may be in this, it cannot be pretended that there is any ſimilarity betwixt cryſtallization and the forms of animals and vegetables; nor can the laws that produce the one, in any circumſtances whatever, produce the other. Cryſtallization is the ſimple concretion of an uniform maſs, in which only one law of matter is employed: but animal and vegetable organization is a very complicated proceſs, in which a great number of different laws which have no neceſſary connection are made to co-operate ſo as to promote one object. This is a thing very different from cryſtallization, and beſides we know no law by which they could produce the forms here impoſed upon them.

If we inquire into the capacities of the material powers to produce the forms of animals, we ſhall find them very unfit for the taſk. If, for inſtance, we examine the bones of animals, keeping in view the principles laid down, I deſire to be informed by what law of matter all their different forms are produced. The great characteriſtic of all laws of matter is an incapacity of change; if, therefore, the form of the bones had been produced by any law of matter, they muſt have been, like the forms of cryſtallization, uniformly alike. It is evident that if a round form is produced by any law of matter, the ſame law can never produce a flat form. It would be merely trifling with the character of neceſſity, to ſuppoſe its forms neceſſary at one time and unneceſſary at another: a neceſſity of this ſort is no neceſſity at all: all the laws of matter are invariable; and if they neceſſarily produce one form, they can never produce another.

The bones of animals are not made to one mould or form, like thoſe forms produced by the laws of cryſtallization. On the contrary, not one bone in the body is like another, excepting thoſe which are made for the ſame purpoſe: it is therefore impoſſible that they ſhould be made by any law of cryſtallization. But as the bones, like all other ſolids, are originally formed of fluids, it might be ſuppoſed the laws of fluidity would prevail. We have, however, ſeen, that the great law and only form of fluidity is a level ſurface; yet there is not one bone in the body poſſeſſed of this form: it is therefore equally impoſſible to account for their form by the laws of fluidity.

Oſſification ſeems to be a ſort of petrifaction, of which calcarious matter forms the principal part. Bones may therefore be compared to thoſe ſtalactites formed upon the roofs and ſides of caverns, which are alſo compoſed of calcareous matter. If the form of the animal bones be produced by any law of matter, we are alſo obliged to ſuppoſe the form of the ſtalactites to be produced by a ſimilar law. In ſhort, we might expect that they only want a proper ſupply of other matter to become animals, with which perhaps ſome good atheiſt may at ſome future day ſupply them. The fact is that the forms of ſtalactites are produced by accidental cauſes, and not by any law of matter, as will evidently appear by examining the fiſſures of the roof, and the form of the ſides of the caverns on which they are produced.

The bones are evidently the ground work of the animal fabric; the muſcular part is built upon them; the brain, the heart, and the lungs, the ſtomach, the liver, all the viſcera, &c. are incloſed within them, as in a caſe made on purpoſe to receive them. If, therefore, the neceſſary form of material action is to be diſcovered anywhere in the animal frame, it ſhould be in the bones; becauſe theſe, being the ground work of its action, muſt be ſuppoſed to be unconfined. If bones be formed by neceſſary laws, you muſt, in order to account for their varieties, ſuppoſe that every bone which differs from another is, at leaſt in part, compoſed of different materials, as in this way only do the chemiſts produce the different ſorts of cryſtals, by varying the compoſition of the materials; but the compoſition of the different bones are the ſame. The very ſame fluid conveys the ſame materials, in the very ſame channels, to to all the different parts of the body in which they are formed; ſo that we can no more account for the formation of the bones on this principle, than by the laws of cryſtallization or fluidity. It is evident, that all their different forms muſt have been impreſſed upon them by ſome external cauſe, and that they are not produced by any inherent laws of their nature. To what cauſe, then, ſhall we aſſign all their varieties, ſeeing they are inconſiſtent with any known law of material action? What character do they bear, by which we ſhall know with certainty how to diſtinguiſh them? Theſe variations are all made ſo as to fit them exactly for the purpoſes to which they are applied. This character no more belongs to accident than it does to neceſſity. Accident works by random; it is as liable to ſubvert as to improve; to render a thing uſeleſs, as to give it the form its real uſe requires. It is therefore as impoſſible to believe that they were made by accident as by the laws of neceſſity. We are therefore conſtrained to believe them to be the workmanſhip of an intelligent and deſigning agent.

If we examine an eye or an arm by any of the known laws of matter, we ſhall ſtill find it impoſſible to explain their formation on the principles of material action. What law is it which forms the bony cavity in which the eye is placed? We know of none that has any ſuch capacity; and if there exiſt ſuch a law, how is it that the cavities for the eyes, the ears, and the noſtrils, are ſo very much unlike? Theſe varieties could never be produced by the ſame law of material action. Accident, I grant, may be ſuppoſed to form cavities, but not ſuch as are here made. There not only exiſt variations altogether contrary to the character of neceſſity, but there are alſo reſemblances, equally inconſiſtent with every idea of their being produced by accident. The eyes, the ears, the noſtrils, are in pairs; and when we conſider that not only the form of each pair, but alſo the ſize and relative poſition, are exactly the ſame, and ſo accurately fitted for the uſes they ſerve, we muſt conclude that nothing but deſign can account for their formation.

The form and character of the eye are equally irreconcilable with the laws of material action: It has evidently been formed by fluids, becauſe ſuch a variety of nerves, muſcles, and membranes, compoſed of different kinds of matter, could never have been intermixed and united in any other ſtate; yet its convex form is not at all conformable to the great law of fluidity: it, however, exactly correſponds with the idea of its being framed by deſign for the uſe to which it is applied. No law of material action can account for the mechaniſm of its parts, for the exact arrangement of its muſcles, and the general diſtribution of its nerves, ſo as to give it the great variety of motion and the nicety of feeling which it poſſeſſes. Neither can theſe laws explain why ſome parts of it are of a fibrous conſtruction, while others are compoſed of laminæ; and ſtill leſs can they account for the introduction of three different tranſparent bodies in the centre, ſo exactly formed for the refraction and concentration of the rays of light upon a large nerve, ſpread out on purpoſe to receive and carry them to the brain. The ſame law can never produce all theſe varieties.

In the formation of the extremities of the body, the ſame difficulties preſent themſelves: for, if we ſuppoſe them to have branched out by any neceſſary law, they ought to have been in all reſpects alike; and if we extend the obſervation to the vegetable ſyſtem, the truth of this concluſion will be further confirmed. If the roots and branches of trees be produced by any neceſſary law, they alſo ought to be the ſame; becauſe the ſame law can never operate in a different manner, and the root ſhould put forth leaves as well as the branches: but ſo far from uniformity in theſe things, the roots and branches even of the ſame ſpecies differ ſo widely from each other, that it is impoſſible to find two trees in all reſpects alike. Animals and vegetables are in a great degree compoſed of the ſame kinds of matter, in as much as they reciprocally furniſh food for each other: we might therefore, on the hypotheſis of their formation by the laws of material action, conclude that the ſame law ſhould prevail in both; and conſequently that leaves would ſhoot out from the fingers of a man, as well as from the branches of a tree. It would be to no purpoſe to follow the principle of neceſſity through all its windings. The abſurdity of ſuch a hypotheſis, it is preſumed, has been already detected. It will therefore be wiſe in us to renounce it in this inſtance, and inquire if the form of the extremities can be better explained on the principle of deſign.

It is impoſſible to conceive any thing better formed for action and motion than the arms and legs of men. The different joints and their whole forms are admirably fitted for their reſpective uſes. The characters of contrivance and deſign appear in every part; and when we conſider, that beſides the bones of the arms and legs, the hands and feet have each of them above 30 different bones, fitted and joined together ſo exactly as to be capable of a vaſt variety of action and motion, we muſt be ſtruck with the difference betwixt this complex machinery, and the ſimple and uniform action of an invariable power. If we examine the different forms of the joints, we ſhall be ſtill more convinced, that theſe machines could only have been made by a power poſſeſſed of extenſive capacities for contrivance. The joints at the ſhoulder, and at the upper part of the thighs, are by their form capable of a rotatory motion; in other words, of moving every way; but the joints of elbows and knees are only capable of moving backwards and forwards. Theſe variations are of incalculable advantage to man. How confined would our capacity of action have been, had we only been capable of moving our arms upwards and downwards, or backwards and forwards? And had we been unable to extend or narrow the ſpace between our legs, we ſhould have been incapable of preſerving our balance, even on level ground, much leſs amidſt the inequalities of ground, and the different poſtures we are continually obliged to aſſume. On the other hand, if the joints at the elbows and knees had been of the rotatory kind, they would have wanted that ſtrength and firmneſs which they poſſeſs. The differences betwixt the arms and legs are no leſs indicative of deſign, than the diviſion of parts, and the ſtructure of the joints. The chief characteriſtic difference betwixt them conſiſts in this, that the arms are more pliable, and the legs are ſtronger. The legs are ſtrengthened at the knee by an additional bone. The ancle is very deficient in that moveability which the joint of the hand poſſeſſes, but in the ſame proportion it is ſo much the ſtronger. The great advantage of theſe differences will appear at once, when we conſider that the legs having the weight of the body, beſides all the burthens the arms can bear, to ſupport; and, on the other hand, the vaſt variety of action required of the arms, rendered pliability more neceſſary than ſtrength. They are not, however, devoid of ſtrength: they unite remarkable quickneſs to a very conſiderable degree of power; a proof that the oppoſite advantages to be gained by mechanical power, have been wiſely balanced and ſkilfully applied. Beſides the motion of the two joints of the arm, the hand is capable of an aſtoniſhing multiplicity of movements. Here the machinery is multiplied in proportion to the action aſſigned to them. What an extent of power has not man obtained by this machinery! What a variety of objects can he not embrace, from the ſtretch of his arm and the graſp of his hand! It is evident from this very ſuperficial view of the mechaniſm of the arms and legs, that they are very nice pieces of work, upon which great labour and ſkill have been employed. They could never have been made either by the throw of a dice, or by the unvaried effort of a neceſſary power.

It would be eaſy to enlarge upon theſe ſubjects; but although we were to go through every part of the body, we ſhould find the ſame difficulty or rather impoſſibility of accounting for its formation by the laws of material action; and it would only tire the reader to dwell on a ſubject ſufficiently clear. Two or three witneſſes are conſidered as good proof at law to eſtabliſh any one fact; ſo in this caſe a few examples will be ſufficient for each head of inquiry. I ſhall therefore proceed to examine, 2dly, How far the material powers are adapted to unite the different parts of the body together, in the order in which they exiſt. The animal body is not only compoſed of a vaſt multiplicity of parts, but alſo a great variety of ſubſtances. The truth of this is undeniable, whether we calculate by the number of ſubſtances of which the aliment is compoſed, or the number of products of which the body is found to conſiſt when analized. If their number is conſiderable, the laws by which they are governed muſt be numerous; and if the laws be numerous, the forms produced by theſe laws will alſo be numerous. This is no unfounded concluſion, no groundleſs hypotheſis; for we find that all the different ſubſtances that cryſtallize, have forms peculiar to themſelves; and we muſt neceſſarily infer, that as they are under different laws, they muſt be independent of each other. It is plain, therefore, that though we were to admit, that the different parts of the body were formed by theſe laws, which we have already proven them to be incompetent for; yet the different parts of the body could never be united together by any neceſſary law. This muſt therefore be left to accident, or referred to deſign. To which of the two, then, ſhall we aſſign it? If we perceive deſign and contrivance in the different members of the body, it is much more apparen in the connection of its different parts. Look through the whole body, and examine the mutual dependence which one part has upon another, and the accuracy by which every thing is fitted to its proper place, and adapted to its proper uſe. Altho' we were to allow, that the different bones of the body had really received their diſtinct and ſeparate forms by the laws of material action, by what means were they united together? The law which formed them had fulfilled its taſk, and had ceaſed to act; it could not have been performed by the general law of attraction, as this has no elective powers, but muſt act upon every part equally in proportion to its proximity; nor by the laws of cryſtallization, or any ſort of particular election, becauſe theſe act only by combination, to which the joining of the bones has not the leaſt reſemblance. There exiſts no law of matter capable of uniting them together, more than of beſtowing on them their original form. We are therefore obliged to look to a deſigning agent as the operator in both caſes.

This idea is greatly ſtrengenthed when we conſider the exact coincidence between the bones and the muſcles. By what other means than by deſign can it happen that the origin of every muſcle in the one bone, and its inſertion in the other, are always at ſuch a diſtance as to allow it to contract and relax in exact proportion to the motion of the joint? No man can conceive that the muſcles could be formed by the law of oſſification. The bones and muſcles are not only compoſed of different materials, but their whole character is different: the one is ſoft, and the other hard; the conſtruction of the one is cellular, that of the other like threads; and the parts of the one are as immoveable as thoſe of the other are elaſtic. As well may it be ſaid that the door and its iron hinges are produced by the ſame law, as that the bones and the muſcles are thus formed. The two firſt are not more different in their nature than the laſt. Neither does the action of the parts of the hinge more accurately regulate the motion of the door, than the action of the muſcles does the motion of the bones. If a man, on examining the mechaniſm of the door and its hinges, is at no loſs to pronounce them the work of an intelligent agent, upon the ſame principle, when he examines the mechaniſm of the bones and muſcles, he muſt draw the ſame concluſion.

If, on examining the eye, you cannot account for the organization of its parts by the laws of matter, you can ſtill leſs account for the formation of thoſe parts that are attached to it. The law which formed the body of the eye could not make the eyelids and brows to defend it, or the lachrymal glands to waſh it; nor could it cut out a channel on the one hand to carry off the ſuperfluous and impure water, and on the other, to perforate the bone of the cranium, in order to direct the optic nerve into the brain. All theſe neceſſarily ſuppoſe different laws and different kinds of matter, as no one law of material action is ſufficient for ſuch operations.

Again, if we examine the connection of the teeth with the gums, we can no more pronounce them to be formed by the ſame law, than that they are made of the ſame materials: yet they are as exactly fitted to each other and to their appropriate purpoſes, as any thing ever made by the hands of men. They are ſo far from being made by the ſame law, that they are not even made at the ſame time; yet how firmly are the teeth ſet, and how accurately are they arranged, either for the purpoſe of cutting or grinding. No man, who examines them, can doubt their being formed and fitted for the purpoſe to which they are applied. Yet this is but one link in the long chain of animal organization: the action of the teeth is only the firſt part of the proceſs by which animal life is preſerved; and if the teeth could not be produced by the ſame law that forms the gums, neither could the ſaliva be produced by that which forms the teeth. In like manner the law which formed the mouth could not produce the tongue, nor that which formed the tongue, the gullet; nor the gullet the ſtomach, nor the ſtomach the liver, the inteſtines, &c. None of theſe things could by any poſſible mode be the cauſe of the other; neither could they be produced by one law of material action, more than they could be formed by accident. Such a variety of parts and forms are as contrary to the nature and character of the material powers, as they are expreſſive of deſign. It is vain to ſay that all theſe are formed by the circulation of the blood and other fluids, becauſe they muſt have been formed before the blood or any other fluid could circulate. The circulation of the blood is not the firſt proceſs of organization: however important this function afterwards becomes, it can never have the rank of primogeniture, but muſt be claſſed among the younger branches of the family. The blood cannot make the veſſels in which it circulates, and ſtill leſs the other parts of the body. Its circulation is even a myſtery in theſe veſſels after they are made; for, though we ſuppoſe it to be carried by the force of gravity in the arteries to the lower parts of the body, by what means is it brought back again by the veins? We know no law of material action by which this is performed and are obliged to ſuppoſe it to be the reſult of ſome ſort of mechanical action produced by the muſcular ſyſtem, in ſome ſuch way as water is raiſed up in the box of a pump. We cannot, therefore, believe that the veſſels by which fluids circulate are produced by the fluids themſelves. Matter has only the capacity of running into a maſs, and, in certain caſes, of forming uniform ſolid bodies called cryſtals, but not of producing ſuch a vaſt multitude of forms altogether unlike each other. It is therefore impoſſible to account for the wonderful machinery of the body by the laws of matter.

The dependence of each part of the body upon another is not only evident in thoſe that are immediately connected, ſuch as the throat with the ſtomach, and the ſtomach with the inteſtines, but there is an adaptation of one thing to another, evident from head to foot, and from one extremity to another. The action of the eyes, the hands, and the feet, correſpond in ſuch a manner as to aſſiſt and be ſubſervient to each other. If the eyes had been placed in the back part of the head, they would have had a contrary direction to the hands and the feet; and we could not have lifted any thing altho' the eyes had fixed on it; neither could we have taken that path which they pointed out. Theſe congruities could no more have been formed by the laws of material action than by accident, or by any power whatever, incapable of acting by concert and plan. There exiſt throughout the whole body a relative connection, and a mutual dependence that every part has upon ſome other, which plainly points out their having been formed by deſign. This might be traced every where; but after the deciſive evidences already ſtated, it is unneceſſary to multiply the proofs of it.—Let us proceed to inquire,

3dly, How far the material powers are calculated to produce the inſtincts and paſſions of animals.—There is nothing more wonderful in the whole animal economy than theſe inſtincts and paſſions. Inſtincts are certain capacities poſſeſſed by animals, which, as they cannot poſſibly be acquired by experience, muſt be original or innate. Who teaches the infant to ſuck, the ſpider to weave his web, and the ſnail and other teſtacious animals to form their ſhells? Who teaches the migrating bird to prepare for his ſafety before the approach of winter, that would certainly deſtroy him; and by what means does he acquire the geographical knowledge of countries he never ſaw, and of paths he never traced? Who teaches animals to know their enemy, whom they never before ſaw, or to take precautions againſt inconveniences they never felt?—Many animals are of a ſolitary nature, and perform their inſtinctive operations by themſelves: they therefore cannot acquire their knowledge from inſtruction, more than by experience. Experiments have been made with ſingle animals, and pairs brought into exiſtence by themſelves; and theſe have been found to poſſeſs the ſame inſtincts, and to perform the ſame work, as others of their kind. It is remarkable that the ſhort lived and the weakeſt animals have the moſt numerous and powerful inſtincts. The inſect kind in general have the ſtrongeſt, ſome of them the moſt wonderful inſtincts. The whole economy of bees is truly aſtoniſhing; and that it is wholly inſtinctive, and not the effects of tuition, is evident from the exact uniformity of all their operations, and from the readineſs with which each of them performs his taſk.

To what claſs of material action ſhall we aſſign theſe inſtincts? I imagine it will puzzle the moſt ſkilful phyſiologiſt to diſcover any thing like them in the nature of material action, or to explain how it can ariſe from any of its combinations. It is a very juſt obſervation, that a tree is known by its fruits. What is the general character of inſtinct? Its general character is, that it is always directed to the preſervation of the animal. The junction of ſo many capacities, all poſſeſſing the ſame character, in ſo many different animals, can neither ariſe from accident, nor from any law of material action. Theſe laws being independent of each other, could never have united in any general plan of action, ſuch as is here made manifeſt. All their capacities known to us are equally calculated to deſtroy as to preſerve, and to pull down as much as to build up. The genial heat which enlivens, if it be increaſed will conſume the animal: the ſame water which refreſhes will alſo drown it. The laws of neceſſity are incapable of ſhewing mercy: you have therefore no ground to infer a preſervative character from ſuch capacities. In moſt caſes the exertions of the powers of inſtinct are voluntary on the part of the animal. The ſpider can form its web when it pleaſes; the beaver and the bee can reſt from their labours when they are tired: but this is entirely inconſiſtent with the nature of material action, which muſt at all times act when it is in circumſtances ſo to do. It is not like the action of attraction, of fermentation, of cryſtallization, or of any other kind of material action, which never can ceaſe until its work is done or its powers exauſted. It is irrational, it is contrary to every law of reaſon, to aſcribe to matter or any thing elſe properties which are inconſiſtent with its nature. It may indeed have properties which we cannot diſcover; but theſe can never be of a nature contrary to thoſe already known. We are therefore obliged to aſcribe inſtinct to a cauſe, the capacities of which are known to have ſome relation to the end produced; and this can be nothing elſe than deſign. It is mind alone that is calculated to conduct a ſeries of actions all to one end; and it is undeniable that all the different inſtincts of animals have this tendency. Some of them are intended to ſupply their wants, others to provide for their ſafety, and the purpoſe of a third claſs is the preſervation of the ſpecies.

The inſtinctive capacities of animals are ſo evidently the effects of deſign, that the materials by which ſome of them are ſupplied are provided long before the animals are capable of uſing them, and are even coeval with their exiſtence. The milk is provided by a ſeparate proceſs, and by different laws of material action, before the young are brought forth. The ſpider and the ſnail have the materials of their work communicated to them along with the ſubſtance of their bodies. The proviſion made by many of the inſect kind for their poſterity is, in many caſes, not wanted till long after the parent is dead: and in other caſes it is entirely of a different kind from what they uſe themſelves, yet exactly conformable to the conſtitution of the larvæ. It is impoſſible that theſe things could be provided for by any other than a deſigning agent.

(2) The *paſſions* of animals have the characters of deſign viſibly written upon them. Their great object in all brute animals is the preſervation of the individual, or the propagation of the ſpecies; but man, beſides theſe which he poſſeſſes in common with the reſt, is endowed with others evidently intended for his improvement. The paſſions of fear and hatred, without doubt, bear the meaneſt

charaċters; yet theſe are no leſs neceſſary than the nobleſt and moſt generous. The weakeſt animals, as they run the greateſt riſk of being injured, are the moſt ſuſceptible of theſe paſſions: the paſſion of fear quickens their pace to fly, and excites them to make uſe of all thoſe devices which nature has put within their power to cover themſelves from danger.

Self-love is the moſt predominant paſſion in all animals, and it is neceſſary that it ſhould be ſo. But in the propagation of the ſpecies, there ſeems to be a direliction of this univerſal principle; and reaſon would in vain attempt to thwart the inſtinctive impulſe of a paſſion common to every ſpecies of animals. Nature has here ſtept out of her ordinary courſe with the moſt marked intention. On what other principle can you account for that ſtrong paſſion which exiſts between the ſexes? Can any man ſay, that it is produced by the laws of matter? Were this the caſe, it could never ceaſe to act when it had the opportunity: but on the contrary, it takes place in brute animals only at certain ſeaſons; and theſe ſeaſons are ſo determined, that, including the times of geſtation and incubation, they are always the moſt favourable for the nouriſhment of the young. Under the influence of this paſſion, the animal ſeems to go out of itſelf: it is impelled by the moſt violent love to another, and ſeems in a great degree to diſregard its own ſafety, in order to gratify its deſires: Nor is this ſtrange and otherwiſe unaccountable paſſion the only thing that points out deſign. On what other principle can we account for the parts of one animal being made exactly to fit thoſe of another; and that a peculiar fluid ſecreted for the purpoſe in the body of the male, and depoſited in that of the female, ſhould be aſſimilated with her correſponding fluids, and nouriſhed by her, as if it were an organized part of her own body, until it becomes a perfect animal, and be excluded when it is fitted for a ſeparate exiſtence. This is not a caſual occurrence, ſuch as may be ſuppoſed to happen by accident. It is the caſe of all animals except the oviparous, which, as if to ſhew that nature is not, like material action, confined to one mode of acting, are brought into exiſtence in a different manner. Let us now mark the progreſs of the plan. The paſſion which originally exiſted betwixt the ſexes takes another direction, and concentrates itſelf in the care of the young. Obſerve the food which nature has prepared in the breaſts of viviparous females; the watching, faſting, and care beſtowed upon the young; and the dangers which even the moſt timid will run rather than deſert their charge, in defence of which many will ſuffer themſelves to be torn to pieces. In thoſe caſes where the female is inſufficient for the charge, ſhe is aſſiſted by the male; but if ſhe is ſufficient for it, the male deſerts her.

Can we ſuppoſe, that ſo complicated, ſo extenſive, yet ſo uniform a proceſs, ſhould be produced by one law? Surely the ſame law which formed the one animal did not form the other in a manner ſo very different; and it is equally apparent, that the law which implanted the one paſſion did not implant others oppoſite. Theſe are evidently the work of an intelligent and deſigning agent, who had in view the preſervation of thoſe works upon which he had originally beſtowed ſo much labour. In truth, there is not any thing in the whole animal economy that more ſtrongly indicates deſign than the ſuperabundant care that is taken to preſerve and to multiply the ſpecies.—Let us now conſider,

4thly, How far the material powers are adapted to produce the varieties of animals.

We have already ſhewn, that it is utterly impoſſible that man, and we may add any other animal, could have been formed by the laws of matter: and if its powers are inadequate to the formation of one, it muſt be ſtill leſs capable of producing ſo great a variety. If we keep in view the great principle formerly laid down, that the material powers are totally incapable of changing their mode of operation, we ſhall readily perceive that the production of variety is contrary to their nature. Before we can admit, as was formerly ſtated, that all the different parts of animals are formed by the laws of matter, we muſt ſuppoſe as many laws as there are differences in the parts; ſo, before we admit that all the varieties of animals and vegetables are produced by theſe laws, we muſt again ſuppoſe the exiſtence of as many laws as there are varieties among them. But if we cannot admit the exiſtence of theſe laws in the caſe of one animal, the ſuppoſition of a double variety is ſtill more improbable. The great framer of the animal ſyſtem has no more confined himſelf to one mode of acting than to one element. The air, the earth, and the water, afford ſcope for immenſe numbers and varieties. When I take a ſurvey of theſe innumerable kinds, I am led to imagine, either that the Deity purpoſely intended to diſplay the inconceivable compaſs of his mind, and the great extent of his power, in order to leave no room to doubt his exiſtence; or that, like a wiſe experimentaliſt, he began with the more ſimple forms, and from theſe proceeded to the more complex; and that he preſerved all theſe varieties as a ſource of future ſatisfaction in the contemplation of his labours. But whatever were his motives, or the ſteps by which he proceeded, it is evident, that this variety is totally irreconcileable with the ſuppoſition of its being the reſult of any law of material action, or of any accidental cauſe.

There are two peculiarities very remarkable with regard to animals, which are as ſtrongly expreſſive of deſign as the configuration of their parts, or any thing we can poſſibly conceive. The firſt of theſe is that every animal is fitted for the ſituation in which it is placed. The birds are formed for moving through the air; the quadrupeds, for moving on the earth; and the fiſhes for moving through the waters, except the teſtaceous kinds, which are evidently framed for living in the bottom. Why did not fins grow on birds as well as fiſhes? There is nothing in the action of ſwimming that has a tendency to produce fins more than wings; for there are many ſpecies of birds who live as much in the water as in the air, and this has never been known to produce a ſingle fin. Why are the eyes of fiſhes ſo much more convex than thoſe of land animals? but becauſe light is leſs refracted by water through the cryſtalline humours than by the air: and why are not birds and land animals furniſhed with gills to enable them to breathe in the water? but becauſe it was intended that they ſhould not paſs the boundaries of their proper element.

It has been contended by ſome, that the parts of animals have grown out of the uſes they are applied to. But if this were the caſe the birds who live on fiſh would certainly acquire gills, from the conſtant practice of putting their heads or whole bodies under water; and much more the cetaceous fiſhes, who live conſtantly in the water. But this habit, continued from age to age from their firſt formation, never changes their original form, or produces in them a new capacity. The ſerpentine tribes, who are all accuſtomed to move upon the earth, ſhould, according to this theory, acquire feet; and the monkeys, who leap from tree to tree, ſhould poſſeſs wings. It would be a very convenient mode of acquiring new capacities, if they could be produced in this manner: we might acquire the wings of birds, the horns of the buffalo, and the trunk of the elephant, by continued efforts to make uſe of ſuch parts. Colleges may be inſtituted for the expreſs purpoſe of making experiments, and for giving the moſt effectual aſſiſtence to thoſe who are deſirous thus to improve the human race: but for my part, I profeſs infidelity upon the point, and am contented with the form and properties which the God of nature has beſtowed upon me.

All the varieties which we perceive either in the earth or water, have evidently been originally formed and fitted for the reſpective ſtations which they hold. It is not mere appendages, but their whole form, that manifeſt the original intention; and even many of theſe appendages are of ſo eſſential a nature, that the animals muſt have periſhed before theſe could have grown upon them. The fiſhes could not live in the water before their gills were formed; the defenceleſs birds would have been deſtroyed ere their wings could have grown; and the elephant muſt have ſtarved without his trunk. Such an hypotheſis is altogether indefenſible. Deſign only can account for theſe wonderful adaptitudes: intelligence alone could execute them. The mechaniſm of all theſe parts and forms could no more have been performed by the laws of matter, which from its nature, is utterly incapable of changing its modes of operation, than the parts could have been produced by any voluntary efforts of the animals themſelves.

The ſecond peculiarity in the animal economy to which I have alluded is, that the internal diſpoſition of animals always correſponds with their external form. This is ſtill more remarkable than the former, and, if poſſible, ſtill more difficult to interpret by the laws of material action, as we know of neither chemical nor mechanical power that can effect it. The internal diſpoſition can no more be the cauſe of the external form, than the external form can be the cauſe of the internal diſpoſition. The canine teeth and claws of the lion could never be produced by his ſmall ſtomach and inteſtines, nor yet by his ravenous diſpoſition; neither could the former be the offspring of the latter. There is no neceſſary connection betwixt theſe things, and we can reſolve them into nothing but the intention of the maker. The bull and the buffalo are very fierce animals, yet they are not carnivorous; and the dog, though he is not herbivorous, is very docile and tame.

I admit, that a difference in the compoſition of animals may conſtitute the blood more or leſs fiery, and that the taſte of the herbivorous claſs may proceed from a great affinity betwixt the compoſition of their bodies and the ſubſtance of vegetables. In theſe matters, the Deity works, in the formation of animals, like a ſkilful chemiſt: but this compoſition can have no relation to a ſtraight line of teeth, or the greater length of the inteſtines: it can never place the cutting teeth in the front, and the grinders at the ſides; nor yet can it produce a long neck and ſeveral ſtomachs. Deſign alone can unite things which have no neceſſary connection, unleſs we ſuppoſe that it may be occaſioned by accident. But when we conſider the great variety of animals, and that their various characters are always aſſociated with ſuch appropriate appendages, we cannot perſuade ourſelves that this could always take place by accident.

In the different ſpecies of any of thoſe larger diviſions of animals called genera, the characters of deſign are equally legible. The ſlight variations by which the different families are marked, ſeem as if they were thus intentionally diverſified to ſhew that neither neceſſity nor caſualty could have any hand in their production, and that the fancy and deſign of the maker had been thus exerciſed ſolely for his own pleaſure and improvement. When we turn from general claſſes to particular animals, the ſame characters of deſign are everywhere conſpicuous. How ſhall we account upon any other principle for that ſingular member the trunk of the elephant, if we do not allow that it has been purpoſely intended to make amends for his unwieldy form, and to enable him to provide more effectually for the wants of his large body? Is there no apparent intention in giving to birds who live on fiſh either long legs to wade the ſtream, or thick down and web feet to enable them to ſwim? Animals who can only live on fruits, have the capacity of climbing trees; while thoſe who live moſtly on roots or on worms have long ſnouts for tearing up the earth. In ſhort, all are provided with the means of procuring ſuch food as is ſuitable to their natures. Even among the weaker kinds, the moſt ſtriking intention is ſometimes diſplayed: the bee is provided with an inſtrument for ſucking the honey from the flower, while at the ſame time it is endowed with an inſtinct to treaſure it up for the winter.

Again, intention is equally manifeſted in the numerous and varied means of defence with which animals are ſupplied. Some have offenſive weapons, and great ſtrength to wield them; others who are weaker are remarkably ſwift: ſome have the power of digging into the earth for ſecurity; others take refuge on trees: thoſe who can neither fight nor fly, have houſes attached to their bodies; and others are endowed with cunning and ſuch like capacities, by which they can elude danger.—In this delightful field it would be eaſy to expatiate; but as I have referred to other works, where the reader will find theſe things treated of at large, I ſhall conclude my obſervations upon them.

Is it poſſible to conceive more ſtriking marks of deſign and intelligence than thoſe diſplayed in the formation, the inſtincts, the paſſions, and the varieties of animals? Shall we allow intelligence to be poſſeſſed by the maker of an optical inſtrument, and refuſe it to the maker of the eye, who was beyond diſpute the firſt inventor of the plan, and diſcoverer of the laws of light, and whoſe work excels all their inſtruments in dexterous machinery, and in the variety of its action? Shall we allow contrivance to the maker of a muſical inſtrument, and deny it to him who formed the ear,—an inſtrument indeed not made for the production of ſound, but which is capable of giving the moſt diſtinct repreſentation of all ſounds? Shall we allow ingenuity to the clockmaker who has put together the parts of a time-piece, and heſitate to grant it to him who has formed and conjoined the aſtoniſhing machinery of the human body? Shall we characteriſe as an intelligent being the grazier, who only makes a turf dyke to defend his cattle, and refuſe that character to him who has made ſo great a variety of animals, and appointed to each of them five guards* for defence? If intelligence is not the agent, by what means do all its higheſt characters here appear? If a blind neceſſity is the ſole operator, how does it happen that, judging of it by its works, it appears to poſſeſs more of deſign, contrivance, and intelligence, than the whole univerſe beſides? By what illuſion is our underſtandings ſo deceived? And if there be deception, how comes it to poſſeſs ſo myſterious power? If it is allowed to have any properties, thoſe of intelligence and deſign appear to be the moſt conſpicuous; and if it is poſſeſſed of theſe, the term Neceſſity is only another name for the Deity, and the whole controverſy has been about a word. On the other hand, if it is only a blind power, which can neither contrive nor execute according to a deſigned plan, it is equally unfit to account for the works of nature as accident, or what is called chance, nay even as the word Nothing.

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* The senses.

There are ſtill ſome other conſiderations which tend to corroborate the arguments I have adduced. Some of theſe I ſhall attempt to diſcuſs in as brief a manner as poſſible. It will, however, be eligible to change the mode of inquiry into a more direct form, and to examine the proofs of intelligence, as they appear, 1ſt, In the connection eſtabliſhed between the animal and vegetable ſyſtems; 2dly, In repleniſhing the earth by one proceſs, and maintaining it by another; 3dly, In the improvability of the earth and of man; 4thly, In the uſe made of the mechanic powers in the animal ſyſtem.

I. Proofs of intelligence appear in the connection eſtabliſhed between the animal and vegetable ſyſtems. Moſt of the arguments uſed in our examination of the forms, varieties, and powers of animals, [illegible] equally apply to vegetables. Theſe alſo poſſeſs a very curious and complicated organization, and they likewiſe contain an inconceivable number of veſſels, in which certain fluids are continually [illegible] or move in circulation, ſupplying the whole body with materials of nouriſhment and growth. The laws of motion alone can no more account for the circulation upwards and downwards than it does for that of animals. They are, like the latter, arranged into diviſions which we call genera and ſpecies, and there alſo exiſts among them an eſtabliſhed commerce betwixt the ſexes, by which reproduction is carried on. In the opinion of the moſt celebrated naturaliſts, they poſſeſs a low degree of ſenſation, which is viſible in ſome plants more than others. They are indeed, by their nature, confined to one ſpot of earth; but they generally obtain a more rapid growth, and yield a greater increaſe, than animals. Some of the perennial kinds expand to a much greater length of body than moſt animals, and their extremities are ſpread out to a greater extent, while they poſſeſs a length of life and durability unknown among the other. The extenſion of their extremities is a very ſtriking proof of deſign, becauſe by this means they occupy a much larger field for the reception of nouriſhment from the earth and the atmoſphere; which is the more neceſſary to them, as they cannot go from place to place in ſearch of it. In ſhort, the ſame proofs of intelligence, contrivance, and deſign, ſo ſtrikingly manifeſt in the animal, are perfectly viſible in the vegetable ſyſtem. But as every man may ſatisfy himſelf on theſe points by conſulting works on natural hiſtory, it is unneceſſary for me to enlarge upon them.

The animal and vegetable ſyſtems are evidently intended to ſupport each other. The animal feeds on vegetables in the ſolid ſtate, but the vegetable having no apparatus for ſwallowing its food, it muſt firſt be diſſolved in the bed of earth, which thus ſerves them for a ſtomach. Vegetables as well as animals derive conſiderable ſupplies of their nouriſhment from the atmoſphere ; a very large ſhare comes from the earth ; and the earth, without the ſupplies which it receives from animals; could only furniſh a ſmall part of the quantity it does. Whatever the vegetable parent gives it is returned to its offspring with an accumulated increaſe, which animals alſo have acquired from the atmoſphere ; and having derived nouriſhment from it themſelves, they give it away to the earth with improved qualities. By the conſtant reiteration of this proceſs do theſe claſſes ſupport and gradually increaſe each other. In the animal ſyſtem, there is a very conſiderable increaſe by the inſtitution of the carnivorous tribes, who take no direct nouriſhment from vegetables, but, on the contrary, are conſtantly ſupplying them with the produce of what they have extracted from the atmoſphere.

This grand and moſt extenſive plan is truly worthy of the higheſt intelligence. It embraces ſo many objects, and connects ſo many things together, as to make it apparent, that the capacities of an intelligent being alone could produce it. All that contrivance and depth of deſign which appear in ſo ſtriking a manner in the animal ſyſtem is here reiterated : there is no part of the plan that is not expreſsly characterized by deſign. Even the inſtitution of the carnivorous tribes of animals, which has puzzled ſo many naturaliſts, is found neceſſary to fertilize the earth, and to bring the two great families more nearly to balance each other. No man can conceive, that accident could produce ſo regular or ſo permanent a ſyſtem; neither is it poſſible that the laws of matter, acting independent of each other, could be its author.

II. In repleniſhing the earth by one proceſs and maintaining it by another, we have a ſtrong proof of intelligence and deſign. The firſt pair of animals and vegetables of every kind muſt have been produced by ſome other mode than generation. It is evident that this muſt have been the caſe, becauſe there were no parents to beget, no ſeeds to grow, nor any matrix to nouriſh them. Generation is, then, only a ſecondary proceſs; and a thing that is derived from others cannot be original.

There are two things to account for in the animal and vegetable ſyſtems: 1ſt, The production of the firſt pairs; 2dly, The proceſs of generation by which the race is perpetuated.—It has already been ſhewn that the laws of matter are incapable of change, as matter can neither loſe its powers nor change its mode of acting. Atheiſts will admit this, if they believe, as they muſt, in the [illegible] of matter; because, if it could either lose its powers, or change its character, it cannot be eternal. It is evident from these principles, that if the laws of matter had ever possessed the power of forming animals and vegetables at any former period, they must always have retained it. How does it happen then, that for some thousand years, as far back as history extends, in no one instance has a new animal or vegetable been formed on the original plan? Will it be contended, that tho' the power still exists, the circumstances favorable to its exertion do not now take place? Is it at the period of a revolution, and at the moment when the elements are in a state of convulsion, that animals are formed? This is impossible; for tho' they had been formed in such a state, they must have been infallibly destroyed. The period in which they were formed must have been favourable to their preservation, and their kinds must have been [illegible] [illegible] [illegible].

[illegible] [illegible] we [illegible] that such circumstances [illegible] [illegible] [illegible] had but once occurred in the age of the world, we might [illegible] that the new world, composed of the same materials and possessed of every degree of temperature and climate, should have been [illegible] to produce the same species of animals and vegetables as the old. But America is destitute of many animals and plants common to the old continents, while it contains others not to be found in them; which cannot be accounted for on the principle of their production by unchangeable material powers.

From theſe conſiderations it is evident, that the ſtate of nature in which animals and vegetables were made could not have been very different from what it now is. Neither can there now be a want of materials, more than a change of circumſtances. Matter has ſtill the ſame powers: all kinds of it are ſtill mixed in all proportions, in every temperature and in every climate where animals and vegetables can exiſt. From the poles to the equator, a round of changes ſtill takes place, yet not one animal or vegetable is known to have been produced in the original mode.

It is to no purpoſe to ſay, that tho' matter has the power, this ſo ſeldom happens that it may have taken place unobſerved. If matter had ever poſſeſſed the power, it could not have been in a ſcanty degree. The production even of a ſingle animal, ſo contrary to the ordinary laws of matter, is in itſelf unaccountable; but this is but a ſmall part of what is neceſſary for perpetuating the race. There muſt at leaſt have been a male and female of every kind produced at the ſame time and place; for however many ſingle productions might have appeared at different times or at different places, they muſt have periſhed without accompliſhing this end. Again: there muſt have been food fit for their nouriſhment ſpontaneouſly produced; they muſt have been placed in a climate in which they could ſubſiſt, and furniſhed with all the inſtincts neceſſary for their preſervation. If a pair of carnivorous animals had been firſt produced they muſt inevitably have periſhed, unleſs there had been a ſufficient number of the other claſe to ſupport them. If theſe caſualties are taken into view, and the great variety of caſes in which they muſt have occurred, it will be impoſſible for any man to perſuade himſelf that the world could have been peopled in the manner we now find it.

The plan of generation and reproduction would have been entirely uſeleſs, had matter poſſeſſed an inherent power to produce animals and vegetables on the original plan. The change can be referred to nothing but deſign, and it only becomes neceſſary becauſe the ſpecies could not have been otherwiſe preſerved. The body of the parent, by a proceſs unknown to us, is made to ſerve as a mould for the formation of the young; and the proceſs is no more performed by the neceſſary laws of matter than the formation of the braſsfounder's mould. In both caſes, every particle of matter is directed to its proper place and proper uſe by the power of deſigning agents.

It is evident that the firſt pair of animals muſt have been made with a view to the continuity of the ſpecies; and this of itſelf gives the moſt deciſive evidence of deſign. It diſcovers a double intention from the beginning, and it required a double work. It conſiſts, not only in the making of the firſt pair, but in the inſtitution of a proceſs, and the conſtruction of machinery, by which the work ſhould be multiplied and perpetuated. It manifeſts a character ſuperior to any thing that man has been able to perform. Not only are the firſt machines above his powers of imitation, but no man has been able to make one machine produce another, after the manner in which this is now performed. In the works of men, there is always, either at the beginning or at the end of the proceſs, a neceſſity for the intervention of manual labour, or of a directive power; but theſe animated machines have gone on, ſince the day they were firſt made, producing one another without the intervention of the original maker at all. Not only have they the capacity of collecting the materials of which they are compoſed from the atmoſphere, the earth, and the water, as well as moulding and faſhioning them to their purpoſe; but the animal part at leaſt has a directive capacity beſtowed upon it, which no human power can communicate to its works.

The higheſt acts of intelligence conſiſt in the foreſight of future wants, and in the adequate proviſion it makes for them. Here, then, are diſplayed, not only a grand extenſive plan, and the largeſt capacity for contrivance, but alſo a proſpective view of future wants, which can only be attributed to a deſigning agent. If the contrivance manifeſted in the formation of the firſt pair of every kind is not ſufficient to convince us of deſign, ſurely the evidence ariſing from the means provided for perpetuating the numerous ſpecies is irreſiſtible. So many things are here connected together evidently for the ſame purpoſe, ſo extenſive is the arrangement, and ſo deep the plan, that nothing could produce it but the greateſt of beings, and the moſt capacious of minds. It is a work every way worthy of the character of him who performed it. The mind of man is but a faint ſhadow of that here diſplayed by the Deity. It will be allowed that man is but an atom when compared with the ſun; ſuch is the mind of man compared with that of the Deity. Our greateſt works and deepeſt deſigns are nothing, when balanced with thoſe diſplayed by the God of nature.

How can that matter which cannot direct the circumſtances of its own action, be ſuppoſed to direct ſo extenſive a proceſs! How can it be ſuppoſed to form extenſive plans, when it has not the capacity of collecting the powers neceſſary to perform them! How can it be ſuppoſed to have a proſpective view of future events, when it poſſeſſes neither a ſentient principle, nor the capacity of acquiring it! No number of independent powers acting without any plan of union, could poſſibly carry on operations ſo variegated, and at the ſame time ſo regular.

III. Proofs of intelligence and deſign are obvious in the improvability of the earth and of man. The earth has only two ſources of improvement: 1ſt, In the connection eſtabliſhed betwixt animals and vegetables, whereby they mutually ſupport each other, and gradually increaſe the prolific powers of the earth; 2dly, By the hand of man, whoſe labour in its cultivation tends powerfully to promote its fertility. The firſt of theſe is as regular and conſtant as the courſe of the ſun. The ſucceſſion of animals and vegetables can never fail: in like manner, the annual ſupply of dead ſtalks and leaves which the vegetables themſelves return to their parent earth, and the ſupply of fluids attracted from the atmoſphere, are perpetual. The ſecond ſource is not ſo ſteady and conſtant as the former, but its capacities are more powerful; and in proportion as men improve and multiply, it muſt alſo advance and keep an equal pace. Man has alſo two ſources of improvement, experience and reaſon. Theſe two go hand in hand in rearing a beautiful fabric, truly worthy of the Deity. The field of reaſon is enlarged in pro-

[illegible] as the boundaries of experience extend. These two are linked together in ſuch a manner, that the one cannot make any rapid progreſs without taking the other along with it. It is a delightful ſubject to trace the principles from which this improvement ariſes, the connection that ſubſists between theſe two principles, and the progreſs from ſtage to ſtage of which they are capable. But as I intend at ſome future period to allot a ſeparate chapter for its conſideration, I ſhall not enter upon it at preſent.

It is evident that neither accident nor neceſſity can be the ſource of any permanent ſtate of improvement. Accident, becauſe it contains no fixed principle of action, is totally incapable of it. It is equally liable to retrograde as to improve, and it may deſtroy to-day what yeſterday had produced. You may as well expect that the looſe and unconnected materials of a building ſhould ſtart up into a regular edifice, as that accident ſhould produce any permanent ſtate of improvement. It has indeed often happened, that accident has been the ſource of very important diſcoveries; but the mere diſcovery only can be imputed to accident; the uſe made of it, and the advantages derived from it, are ſolely to be aſcribed to mind.

Neither can the laws of neceſſity be the ſource of improvement, becauſe ſo far as any thing is unchangeable in its nature, it can never be improved. Although every change is not an improvement, every improvement is a change; and whatever is incapable of change is alſo incapable of improvement. You may purſue the laws of matter through all nature, and ſtill find them abſolutely unimprovable, becauſe they are unchangeable; you may form cryſtals a thouſand times over, but you can make no improvement with the ſame materials. You may change water into vapour, and vapour into gas; but you can neither vary the proceſs nor change the production. So far only as you can change the combinations of matter, the compoſition may be improved. You may, by adding to it new materials, communicate new properties; but in ſo far as theſe combinations are ſubjected to the invariable laws of neceſſity, they are abſolutely unimprovable.

Theſe ſources of improvement are undeniably the offspring of mind. We have ſeen that mind only could have eſtabliſhed the connection betwixt animals and vegetables, and it is upon mind that it depends for thoſe higher pitches of improvement of which it is ſuceptible by cultivation. It has been already obſerved, that the exiſtence of mind on a ſmall ſcale gives reaſon to infer its exiſtence on a larger; and when we conſider, that this neceſſity, which has been held up as the origin of all things, is, from its nature, incapable of being the ſource of improvement, we cannot but acknowledge that a higher intelligence than man muſt exiſt, before we can account for the regular ſyſtem of improvement eſtabliſhed in nature.

IV. In the uſe that is made of the mechanic powers, proofs of intelligence are apparent. What is mechanical power? It is a ſcience of mind, and not a property of matter. It may indeed be ſaid, that matter is the baſis upon which it reſts; but it can never be ſuppoſed to have an inherent exiſtence in it. Matter is only the ſubject wrought upon, but the principle exiſts in things perfectly diſtinct from it. The whole materials of a machine may be ſcattered about, or may be heaped together for ages, but they can never be formed into an engine by any of the inherent powers of matter. The power is derived from the form that is communicated to it, and from the arrangement in which it is placed. If you deſtroy the form and arrangement of the materials, you deſtroy the power; and if you reſtore their form and arrangement, you alſo reſtore the power. We have already ſhewn the incapacity of matter to produce forms; it is therefore altogether unwarrantable to ſuppoſe, that theſe forms and arrangements could be produced by the powers of matter. It is evident from theſe few remarks, that there cannot be two things more widely different in their nature than mechanical and chemical power. Chemical power belongs as excluſively to matter, as mechanical power is the property of mind. Chemical power has no dependence upon form; it is inherent in matter in every form and ſhape; and you can no more deſtroy its power than its exiſtence. In all theſe things it is the very oppoſite of mechanical power; and it is utterly impoſſible that the one can in any view be ſuppoſed to proceed from the other. If therefore, we find mechanical power employed in the works of nature, we can never aſcribe it to material action: we are obliged to look either to accident or intelligence as its efficient cauſe. No man can ſuppoſe that accident ever produced a corn mill or a ſteam engine; and there is ſtill leſs reaſon to ſuppoſe it to have been the author of the mechaniſm which appears in nature's works.

We have already noticed the application of mechanical force in planetary motion; and if we turn our attention to the body of an animal, we ſhall find it very generally applied. Not only is every joint of the body mechanically fitted to its proper uſe, and formed ſo as to unite with its correſpondent parts, but there is an univerſal application of mechanical power throughout the whole body. In every joint the bones are made to ſerve as levers for the muſcles to act upon; and they are always ſo formed as to produce, by their contractions and relaxations, the exact motion which the joint requires. In ſome joints, the muſcles are inſerted ſo as to produce power, in others to acquire velocity; but theſe variations are evidently made with a view to the advantage of the animal. The joint of a man's ſhoulder is ſo conſtructed as to gain motion; the joint of the knee to gain power. The knee is a very important joint, and having the weight of the body to ſupport, it requires great ſtrength and firmneſs, as well as a very conſiderable degree of motion; it is therefore furniſhed with an additional bone, called the knee-pan, which not only tends to preſerve the joint from injury, but as the muſcles are inſerted, or rather incorporated with it, ſerves as a pulley in carrying their direction farther from the centre of motion, by which means their power is greatly increaſed. Another inſtance of the uſe of the pulley is mentioned by Dr. Paley in the conſtruction of the muſcle which draws the nectitating membrane over the eyes of ſome birds. The muſcle is paſſed through a loop formed by another muſcle, and is there inflected, as it were, round a pulley, which, by lengthening the muſcle, enables it to draw the membrane over the whole eye, and which, without this contrivance, it could not have done.

There is in theſe inſtances and ſeveral others ſo direct an application of mechanical power, as to admit no doubt not only of the intention, but alſo of the ſkill of the maker. The mechaniſm of the eye ſhews his ſkill in optics; that of the ear, his ſkill in the ſcience of accouſtics, or the nature of ſound; the lungs, his knowledge in pneumatics; the ſtomach, the liver, the kidneys, and all the different glands, his ſkill in chemiſtry. The knowledge of theſe ſciences diſplayed in animal organization, is far ſuperior to what men have been able to diſcover; notwithſtanding theſe ſubjects have occupied their attention for many ages, effects are here produced which they have never been able to imitate. How unreaſonable is it to admit, that intelligence is neceſſary to perform the paltry and ſuperficial works of men, and yet deny it to be neceſſary in the grand and majeſtic, in the deep and profound operations of nature, which we have never been, nor probably ever ſhall be able fully to unravel and underſtand!

We have now examined the queſtion concerning the exiſtence of the Deity. On the one hand we have found, that ſo far is matter from being poſſeſſed of inherent capacities for the production of all thoſe varieties of form which are found to exiſt in animals and vegetables, that its whole powers in this reſpect are confined to the formation of a few cryſtals, and to the level ſurface of fluids; in all other reſpects it is incapable of producing form, but passively submits to whatever form accident and design impose upon it. On the other hand, we have shewn, that the existence of intelligence in man affords a presumption in favour of a higher intelligence; and that this presumption is not only strengthened, but made obvious, by the proofs of design and contrivance which appear in nature's works: that whether we examine the particular parts of animals, or a junction of these parts in one body; whether we examine the instincts, passions and varieties of animals, or the connection established between animals and vegetables, or the change of process from the mode by which the earth was at first replenished to that by which it is maintained; whether we examine the improvability of the earth and man, or the use [illegible] of the mechanic powers, and, we [illegible] the principles of [illegible], with [illegible] things bear [illegible] of design [illegible] intelligence [illegible] explained on [illegible] of matter, in [illegible] the subject, [illegible] assigned [illegible] the whole [illegible] nature. [illegible] renders it [illegible] and correſponding forms, where the power and the capacity depend ſo much on form. The unchangeability of matter renders it incapable of producing that great variety which looks like nothing but the ſport of mind. The powers of inſtinct and paſſion can be referred to no unthinking cauſe, for intention appears throughout them all; and we muſt either ſuppoſe matter capable of thought, or aſſign theſe to a being poſſeſſed of it. The man who, after examining the evidence, ſtill remains unſatisfied, appears to me either not to have duly conſidered the ſubject, or to have his mind warped by ſome ſtrong prejudice, which prevents him from perceiving its force. And as I conſider this to be the principal cauſe of atheiſm, I ſhall purſue the inquiry a little further, and examine into the character of the Deity; in order to diſcover whether falſe views on this head have not been the great ſtumbling-block on which moſt of atheiſts have fallen.

## SECTION II.

### *Of the Character of the Deity.*

IT is impoſſible to behold the diſpoſition of the great planetary bodies, or to contemplate the vaſt labour which has been beſtowed in filling them with inhabitants, without being ſtrongly impreſſed with the power and greatneſs of the Deity. It is equally impoſſible to examine the accurate arrangement by which every thing is diſpoſed, the curious machinery employed in the ſtructure of animals and vegetables, and the abundant care by which their numerous varieties are ſupported, without entertaining an impreſſive ſenſe of his wiſdom and goodneſs. The limited view of his works which even our earth affords, fills us with admiration; but when we raiſe our minds to the contemplation of other worlds, and perhaps of other ſolar ſyſtems, arranged by the ſame power and ſupplied by the ſame labour, we are not only unable to follow out the inquiry, but are loſt in wonder and aſtoniſhment.

As the diſplay of ſuch high degrees of power, wiſdom, and goodneſs, far exceeds any ſtandard we can apply to it, thoſe who acknowledge the exiſtence of a Deity have, by a principle very natural to mankind, ſuppoſed that they could never exalt him too high: and as they could not determine the exact meaſure of his greatneſs, they have ſtretched it as high as language can carry it. They have not only clothed him with a creative power, and denied ſelf-exiſtence to every thing elſe, but they have deſcribed him as almighty, or infinite in power, and as filling all ſpace or poſſeſſed of immenſity; thus ſetting aſide every limit to his power or his capacity, and making him both omnipotent and omnipreſent.

However laudable a becoming zeal for the honour of the Deity may be, theſe keen advocates for his unqualified power and greatneſs ought not to have carried their ideas higher than his works repreſent him. It is from theſe only that we can diſcover his true character, in the ſame way as it is by his works alone that we can prove his exiſtence.

The advocates for the exiſtence of the Deity ſeem to have forgotten, that by exalting his power beyond the evidence manifeſted by his works, they render the idea of his exiſtence much more problematical. Let them remember, that by aſcribing to him too much power, they render his juſt claims the more equivocal. An extravagant claim is always an object of ſuſpicion, and ſuſpicion muſt ever have a ſtrong tendency to prevent fair inquiry. The man who is ſuſpicious is much more liable to ſtop ſhort, and reject inferences juſtly drawn, than to admit thoſe which are ill ſupported. This will be found to be the real foundation of atheiſm. It is vain to look elſewhere, or to aſſign a multitude of reaſons for its prevelence, when this alone is ſufficient. It is vain to ſay, that it ariſes from hatred of what is good, and the love of what is evil. There are very few men, even among the vicious, who will dare to juſtify vice: virtue commands reſpect among thoſe who leaſt practiſe it. In like manner, there are very few who will reject a clear proof, unleſs they find ſomething contradictory to fix upon; but an exaggerated view or a falſe picture is ſure to be rejected.

The evidence of the exiſtence of the Deity is ſo clearly manifeſted by his works, that we need go no further in ſearch of additional arguments to ſupport it; and the ſimple view of the facts can derive no ſupport from exaggeration or additional coluring. If we reſt upon this foundation, our faith will be immovable; but if we attempt to build upon a falſe ground, to ſtrengthen the fabric by additional props, or to disfigure it by clumſy ornaments, we ſhall only injure its form and ſpoil its beauty.

The appearances of imperfection and the exiſtence of evil have in all ages perplexed the worſhippers of the Deity. But inſtead of making their opinions correſpond with the character of his works, and judging of his power by that ſtandard, they have exerted their whole ſtrength and ingenuity to reconcile theſe evils and this imperfection with the extravagant opinion of infinite and almighty power. On the other hand, the atheiſt, perceiving this inconſiſtency, inſtead of merely attacking this prepoſterous character aſcribed to the Deity, has moſt unfortunately directed his ſhafts againſt the exiſtence of a ſupreme being. He has undeniable evidence that the works of nature are always performed by means of the inherent capacities of the material powers; hence he has overlooked all the traces of arrangement, deſign, and contrivance, which appear ſo conſpicuous, and which manifeſt ſo fully the exiſtence of an intelligent cauſe. While both parties ſtand upon equally untenable ground, and while they continue to leave one ſide entirely defenceleſs, it muſt always happen, that the right wing of each army will prevail againſt the left of the other, and thus leave the victory undcided.

The moſt celebrated work in defence of infinite power and immenſity, is Dr. Clarke's diſcourſes at Boyle's Lectures, "upon the Being and Attributes of God." I ſhall conſider theſe diſcourſes as the ritual of thoſe whoſe opinions he adopts, and ſhall accordingly examine his arguments.

In his 6th propoſition he undertakes to prove, that the Deity, or the ſelf-exiſtent being, muſt be infinite and omnipreſent, or poſſeſſed of infinite power and immenſity. "The idea of infinity
" or immenſity (ſays he) as well as of eternity, is
" ſo cloſely connected with that of ſelf-exiſtence,
" that, becauſe it is impoſſible but ſomething muſt
" be infinite, independently and of itſelf (for elſe
" it would be impoſſible that there ſhould be
" any infinite at all, unleſs that an effect could be
" perfecter than its cauſe,) therefore it muſt of
" neceſſity be ſelf-exiſtent. And becauſe of ne-
" ceſſity ſomething muſt be ſelf-exiſtent, therefore
" it is neceſſary that it muſt likewiſe be infinite.
" To be ſelf-exiſtent (as has already been ſhewn)
" is to exiſt by an abſolute neceſſity in the nature
" of the thing itſelf. Now, this neceſſity being
" abſolute in itſelf, and not dependent on any out-
" ward cauſe, it is evident it muſt be every where,
" as well as always unalterably the ſame. For a
" neceſſity which is not every where the ſame, is
" plainly a conſequential neceſſity only, depending
" upon ſome external cauſe, and not an abſolute
" neceſſity in its own nature: for a neceſſity ab-
" ſolutely ſuch in itſelf, has no relation to time,
" nor place, nor any thing elſe. Whatever there-
" fore exiſts by an abſolute neceſſity in its own

" nature muſt needs be infinite as well as eternal.
" To ſuppoſe a finite being to be ſelf-exiſtent, is
" to ſay that it is a contradiction for that being
" not to exiſt, the abſence of which may yet be
" conceived without a contradiction,—which is
" the greateſt abſurdity in the world; for if a be-
" ing can without a contradiction be abſent from
" one place, it may without a contradiction be
" abſent from another place, and from all places.
" And whatever neceſſity it may have of exiſting,
" muſt ariſe from ſome external cauſe and not
" abſolutely from itſelf, conſequently the being
" cannot be ſelf-exiſtent."

In the laſt chapter we examined the character of ſelf or eternal exiſtence, and found Dr. Clarke's definition of it altogether inadmiſſible; it is therefore unneceſſary again to enter upon it here. Self exiſtence is admitted by both parties, but I cannot perceive how the idea of infinity and immenſity ſhould be included in it. Neither does he attempt to prove it, but merely aſſumes it, as if it were a thing ſelf-evident.

It has been already ſhewn, that ſelf-exiſtence implies nothing but the idea of indeſtructibility, and that whatever is indeſtructible muſt be ſelf-exiſtent, but it does not imply either infinity or immenſity. Self-exiſtence is here confounded with immenſity, a character with which it can have no connection at all. I admit that ſelf-exiſtence has no relation to time or place; but this by no means implies that it muſt be in all places at once; it only declares that it muſt exiſt in ſome place or other, but not that it muſt occupy all ſpace. Immenſity is no more included in the idea of eternal duration, than the idea of infinite breadth is included in that of infinite length. As well may it be ſaid that an infinite line muſt poſſeſs an infinite ſolid content, or that the breadth and thickneſs of any thing muſt always be equal to its length, as that ſelf-exiſtence muſt imply immenſity or infinity. It is as impoſſible to annihilate a ſmall quantity of matter as to deſtroy the whole materials of our globe. Self-exiſtence conſiſts not in the extent, but in the immortality of its nature. The belief of exiſtence does not depend upon our being preſent with an object. We know moſt certainly the exiſtence of a thouſand things which we have never ſeen: and many of thoſe we have ſeen, we know to exiſt as certainly when abſent as when they are preſent with us. It is therefore a very falſe aſſumption, that immenſity is implied in the idea of ſelf-exiſtence.

A being that is indeſtructible muſt exiſt ſomewhere; and there is no inconſiſtency in the idea of its being carried from place to place. There is therefore the greateſt abſurdity in the concluding part of Dr. Clarke's argument, "That if a

" being can without contradiction be abſent from " one place, it may without a contradiction be ab- " ſent from another place, and from all places." A ſelf-exiſtent being, as well as all other beings, muſt exiſt ſomewhere; and its abſence from any particular place is no proof of non-exiſtence; elſe we could never be ſure of the exiſtence of any thing unleſs it were preſent with us. The proof of ſelf-exiſtence does not in the ſmalleſt degree make the idea of immenſity either more or leſs conceivable or probable. Self-exiſtence, immenſity, and infinity, are not at all analogous. The more that we examine into the nature of the thing the more clearly we perceive that ſomething muſt be ſelf-exiſtent. But the caſe is very different as to immenſity and infinity; when we attempt to form a conception of ſuch properties, our underſtanding revolts, and reaſon pronounces them impoſſible.

In our examination of matter we found, that extreme minuteneſs is one of its eſſential properties; that all the large maſſes of matter are changeable and diſſoluble, but that the inviſible particles are neither deſtructible nor liable to diſſolution. This is the very oppoſite of immenſity and infinity; but it is more conſiſtent with any ideas we can form of ſelf-exiſtence than theſe others. All reaſoning muſt either be founded on facts, or on ſelf-evident principles, and without theſe no man can reaſon: but Dr. Clarke has neither facts nor ſelf-evident principles to reaſon upon: his hypotheſis is equally unſupported as "the baſeleſs fabric of a viſion." The deſtruction of a body is the ſeparation of its parts; it is the looſing of that connection, the diſſolution of that form, which formerly ſubſiſted. It by no means implies, that the particles of which it is compoſed loſe either their powers or their properties; for all experiments prove they do not. The body is deſtroyed, but the particles are found to be unchangeable or indeſtructible, and therefore they muſt be eternal. This is the only juſt idea of ſelf-exiſtence which we can form.

Dr Clarke makes uſe of another argument drawn from *ſpace*. In prop. 3. he contends, "that to ſuppoſe immenſity removed out of the univerſe, or not neceſſarily eternal, is an expreſs contradiction, intuitively evident to every one who attends to his own ideas, and conſiders the eſſential nature of things. To ſuppoſe any part of ſpace removed, is to ſuppoſe it removed from and out of itſelf; and to ſuppoſe the whole to be taken away, is ſuppoſing it to be taken away from itſelf; that is, taken away while it ſtill remains, which is a contradiction in terms. There is no obſcurity in the argument, but what ariſes to thoſe who think immenſe ſpace to be abſolutely nothing, which notion is itſelf likewiſe an ex-

“ preſs contradiction; for nothing is that which
“ has no properties or modes whatever; that is to
“ ſay, that of which nothing can be truly affirmed,
“ and of which every thing can be truly denied,
“ which is not the caſe with immenſity or ſpace.”

This is indeed ſtrange reaſoning. It is not only a begging of the queſtion, but he alſo confounds things together which muſt ever be ſeparated. What has the queſtion of immenſity, as applied to a poſitive exiſtence, to do with void ſpace? I have indeed ſomewhere ſeen it ſtated, that Dr. Clarke conſiders ſpace as a property of God: but this is, to ſay the leaſt of it, very inconſiſtent with his own opinion, and that of other divines, concerning the ſpiritual nature of the Deity. In a former part of his argument, he very juſtly ſtated, that ſelf-exiſtence has no relation to time or place; and with equal juſtice, I contend, that an immaterial being can have no relation to ſpace. If the Deity is immaterial, it is impoſſible that ſpace can be a property of a being which can occupy no part of it. The idea of ſuch a being poſſeſſing ſpace is truly contradictory. How can he, in any ſenſe, be ſaid to poſſeſs ſpace, when he can fill no part of it? Space has no relation to any thing but matter; and if the Deity be immaterial, he can make no uſe of ſpace, except when he operates upon matter. The idea of ſpace is not connected with the idea of Deity, for ſpace muſt be admitted, whether we acknowledge the exiſtence of a Deity or not. It can neither be derived from him, nor he from it; and whether he is finite or infinite, it neither contracts nor enlarges our conceptions of ſpace.

If ſpace can be conſidered a property of any ſort of exiſtence, it muſt belong to material bodies, becauſe theſe poſſeſs a certain portion of it in order to contain them. If we wiſh to form any preciſe notions of ſpace, we muſt confine our ideas to that part of it which contains the univerſe. Here there are certain portions of ſpace and relations of diſtance, ariſing from the extent and poſitions of material bodies, which are calculated to give us clear and determinate notions of it; but if we extend our ideas beyond this, we have done. What are the properties of ſpace, and what conceptions of it can we form? I ſhall be told that it contains extenſion. And, pray, what ſort of extenſion is it? An extended nothing. We can no more ſet bounds to that which is nothing, than to that which is called ſpace. If it is not "that of which nothing can be truly affirmed, and of which every thing can be truly denied," it is the next thing to it: and it can no more anſwer the purpoſe of Dr. Clarke in his attempts to prove immenſity than any negative whatever. An immaterial being may, with as much propriety, be ſuppoſed to be contained in a ſingle point, as to

for that which fills all ſpace muſt clude every thing elſe: and if all ade by him, and out of his eſſence, ad originally been poſſeſſed of im- uſt now be diminiſhed. A being ſpace muſt be incapable of motion; le of motion, it muſt be, of conſe- able of action; as, on the principles n, action and motion are always con- void ſpace we can perceive no trace nce, and ſtill leſs of his being poſſeſſed y. Again: if, to avoid all theſe ies, we reject the principles of materi- ther, it has been already ſhewn, that an being can in no ſenſe be ſuppoſed to nenſity of ſpace.

now conſider the ſubject of infinite or power.

head Dr. Clarke is more moderate than is fellows. He does not uſe the phraſe but only Infinite power; a term leſs n the other, and which he limits to all ings, or things which do not imply a on. His reaſoning in ſupport of in- r is very ſhort: it is founded on the aſ that as the Deity only can be ſelf-exiſt ſt be the creator and ſovereign diſpo- nings, and have abſolute power to do ies, becauſe nothing can make any refill all ſpace. It is not neceſſary for a being to be everywhere preſent in order to poſſeſs extenſive power. The ſun is at a vaſt diſtance from the planets, yet his action influences them all. If ſuch power be exerted by matter, ſhall we be juſtified in aſſerting, that the Deity cannot act except upon the preciſe ſpot where he is placed, or unleſs he be allowed to poſſeſs ſuch an unconceivable exiſtence, ſuch a prepoſterous and abſurd character, as that of immenſity, or extending over all ſpace?

The idea of a being poſſeſſing eternal exiſtence is very different from that of a being poſſeſſed of immenſity; for though we can no more extend our views to take in the proſpect of eternity than we can take in the view of immenſity, we can clearly perceive that ſome being or beings muſt have poſſeſſed an eternal exiſtence, elſe they muſt have been made out of nothing, as well as by nothing; but as ſuch a notion cannot for a moment be entertained, we are obliged to admit the other. The idea of immenſity, as applied to a poſitive exiſtence, is ſupported by no ſuch baſis. We can no more conceive how any thing can be poſſeſſed of immenſity, than we can comprehend the thing itſelf; and the more we attempt to reaſon on it, the more contradictory to reaſon does it appear.

If we judge of immenſity by the principles of materialiſm, a being poſſeſſed of ſuch a property would exclude the idea of any other exiſtence but himſelf; for that which fills all ſpace, muſt neceſſarily exclude every thing elſe: and if all things were made by him, and out of his eſſence, although he had originally been poſſeſſed of immenſity, he muſt now be diminiſhed. A being which fills all ſpace muſt be incapable of motion; and if incapable of motion, it muſt be, of conſequence, incapable of action; as, on the principles of materialiſm, action and motion are always conjoined. In void ſpace we can perceive no trace of his exiſtence, and ſtill leſs of his being poſſeſſed of immenſity. Again: if, to avoid all theſe inconſiſtencies, we reject the principles of materialiſm altogether, it has been already ſhewn, that an immaterial being can in no ſenſe be ſuppoſed to fill the immenſity of ſpace.

Let us now conſider the ſubject of infinite or almighty power.

On this head Dr. Clarke is more moderate than many of his fellows. He does not uſe the phraſe Almighty, but only Infinite power; a term leſs preciſe than the other, and which he limits to all poſſible things, or things which do not imply a contradiction. His reaſoning in ſupport of infinite power is very ſhort: it is founded on the aſſumption, that as the Deity only ca nbe ſelf-exiſtent, he muſt be the creator and ſovereign diſpoſer of all things, and have abſolute power to do as he pleaſes, becauſe nothing can make any reſiſtence to his will. This principle I have already examined, and have ſhewn, that the ſelf-exiſtence and immutability of matter reſt upon the deciſive teſt of experiment, and that a creating power is impoſſible.

The queſtion concerning infinite and almighty power does not reſt upon mere abſtract reaſoning. I have already obſerved, that the proofs of the exiſtence of the Deity are only to be found in his works. In what manner, then, ſhall we be able to judge of his character and properties, but by the ſame ſtandard? No hypotheſis can be founded in truth that is inconſiſtent with the view given by this perfect mirror, which neither magnifies nor diminiſhes the object it repreſents, and repreſents nothing that does not truly exiſt.

The exiſtence of evil and the ſufferings of the innocent are by no means irreconcilable with the idea of an improvable ſyſtem, which, although deſigned upon the beſt poſſible principles, is far from being perfect, and labours under all the diſadvantages ariſing from the contending war of elements and the conflict of tumultuous but neceſſary paſſions, which produce an awful catalogue of phyſical and moral evils. But, on the other hand, if we examine the works of nature, and the face of the moral world, by the ſtandard of abſolute perfection, we ſhall find, that either almighty power or infinite goodneſs has been wanting in the plan.

If the Deity had been poſſeſſed of infinite power, if he had been the creator of matter, and had beſtowed upon it all its powers and properties, it would have been eaſy for him to have guarded againſt every evil: he could have prevented the deſtructive flaſh of lightning, and the terrible exploſion of the volcano; the devouring ſhock of the earthquake, and the exiſtence of every peſtilential diſorder. Why did he not enrich the earth with never-failing fertility, and regulate the ſeaſons ſo as to prevent the deſtruction of its precious productions? Why did he not moderate the heat of the torrid and the cold of the frigid zone, and make every ſpot capable of providing for the wants and increaſing the comforts of his creatures? What father, even among men, would ſend his children to Lapland, if he could provide for them in the fertile plains of Lombardy, or in the temperate iſlands of the Canaries? A being of ordinary goodneſs would have prevented every evil, and beſtowed every good in his power, for his own honour, and for the pleaſure of beholding the perfection and happineſs of his creatures. And it is altogether impoſſible that infinite goodneſs, accompanied with infinite power, could ever have permitted one innocent perſon to ſuffer, or one evil to take place; far leſs thouſands to ſtruggle with misfortune, and to periſh in every age.

It is vain to plead the power of ſovereignty, or the right of doing as he pleaſes. The power of doing evil can never give it ſanction. A good being can never commit a bad action, ſo neither can he ſuffer evil to be committed, if it is in his power to prevent it. It is in vain to plead the intention of procuring future good, or of preventing greater evils; infinite and almighty power could have prevented every evil, and brought about every good, as eaſily as it could have been the author of this imperfect ſtate. Every degree of imperfection is contrary to the nature of a perfect being. The works of an infinitely perfect being muſt be conformable to his character—they muſt be perfect in the higheſt degree: they cannot even be capable of improvement; becauſe when a thing is abſolutely perfect, every alteration would only make it worſe. If the Deity could have made a better world, and could have excluded evil, pain, and miſery, he muſt of neceſſity have done it; as a contrary conduct would have been acting directly contrary to the character of a being juſt and good.

Imperfection in the work is an infallible proof that the maker is not poſſeſſed of infinite power, as it is only by the want of power, and where of neceſſity there can be no choice, but of two evils to chooſe the leſs that the exiſtence of evil can be admitted. We can readily conceive that a good being may make an imperfect work, or what is more ſtrictly applicable to this caſe, that a very great and powerful being may yet not be able to preform every thing, or to prevent every evil; but we can have no conception how a being poſſeſſed of infinite and almighty power could permit evil, or make an imperfect work.

The perfection of a limited power is only of a relative nature; as regard muſt always be had to the circumſtances in which he acts, and the nature of the materials upon which he has to operate. The works of a limited power may admit of imperfection without any charge againſt the maker, becauſe the beſt workman cannot perform more than the nature of his materials will admit; but the caſe is entirely different, on the ſuppoſition that the maker is poſſeſſed of infinite and almighty power, and has created the materials as well as made the work. In this caſe, no imperfection can be admitted, as every thing ought to be ſuitable to the character of the maker, perfect in all reſpects, without the poſſibility of going wrong; as whatever is liable to derangement is far from being abſolutely perfect.

The exiſtence of evil, and the prevalence of much wickedneſs and miſery, are undeniable: the ſyſtem is therefore not abſolutely perfect; and we muſt admit that the Deity is either not poſſeſſed of infinite power, or that he is not infinite in goodneſs; as theſe qualities united muſt, from their nature, have excluded evil and miſery from the earth. Infinite and almighty power takes away every idea of neceſſity; becauſe, if he could not make them better, he is not infinitely powerful. On the other hand, if his power enabled him to exclude all evil, and he ſtill decreed that it ſhould exiſt, he can have no claim to the character of being infinitely good. There is no evading either the one concluſion or the other; and every man may judge for himſelf which of the two opinions he ſhall eſpouſe, as it is impoſſible, conſiſtently with the evidence of facts, that he can hold both. My reaſon leads me to reject infinite power, not only as an unconceivable and prepoſterous notion, but becauſe it is the only view of the character of the Deity which is reconcileable with the plan of nature's works, and by which his goodneſs, juſtice, and benevolence, can be eſtabliſhed upon a ſure foundation.

It is impoſſible to explain the ſyſtem of nature, ſo as to account for the exiſtence of evil, on any other principle than by viewing it not as a perfect but as an improvable ſyſtem, and by conſidering the Deity not as an infinite, but as a limited power. If the Deity had not been tied down by the nature of his materials, is it poſſible that we ſhould perceive that eternal jarring and diſcord (as it were) among the elements; that warfare which at one time deſtroys what his beneficence had beſtowed at another? Even his favourite man, the moſt perfect of all his works, on whom he has beſtowed ſo much contrivance and labour, partakes of this imperfection, and, like the complicated machines of men's making, is very apt to go wrong. A being having the capacity of making his own materials, and poſſeſſed of infinite power, could have given them what ſtamp he pleaſed, and by the formation of one ſimple character have performed that on which much labour muſt have been beſtowed. He would have avoided that complicated machinery, which is ſo liable to be deranged, or at leaſt have given it a ſtamp of perfection conſiſtent with the character of almighty power.

No being would have beſtowed ſo much labour upon his work, if he could have performed it by a more ſimple proceſs. A perfect being muſt, from his nature, adopt the ſimpleſt mode of working, becauſe it is always the moſt perfect. That which is ſuperfluous and unneceſſary is as far from perfection as that which is wanting. Wherever, therefore, we perceive unneceſſary labour beſtowed, we may hold it certain, that the workman could do no better. It is worthy of remark, that as the animal frame bears the cleareſt teſtimony to the exiſtence of the Deity, ſo it alſo affords the ſtrongeſt proofs that he cannot operate, except by means of the material powers. The ſhort period of life, and the many diſorders to which it is liable, have always been the ſubject of regret to the philanthropiſt, and a bar in the road of the ſerious inquirer. If man had been made upon more ſimple principles, he ſhould have been both eaſier maintained, and liable to fewer diſorders. His time, inſtead of being ~~almoſt~~ wholly taken up in ſearch of a precarious and temporary ſubſiſtence, ſhould have been directed to what is conſidered the great end of his being; and, inſtead of that temporary exiſtence which he at preſent is ſubjected to, he ſhould have been as durable as the ſtones of the field.

It is only upon this principle of neceſſity that the imperfection of man and other animals can be accounted for: it is by this only, the exiſtence of evil can be reconciled with the venerable character of the Deity as a juſt and good being.

Would the Deity have made his chief and greateſt work, his deputy governor and the great improver of the earth, ſo extremely dependent upon temporary ſupplies, if he could have been made equally active without them; ſo liable to diſorder if he could have ſimplified the machine; ſo temporary in his exiſtence, as hardly to have arrived at maturity before he begins to decay; ſcarcely to have learned the knowledge of his duty, and to regulate his paſſions, before he dies, could he have been made more durable and more perfect? Theſe glaring defects, theſe imperfections, and the many evils which are prevalent, are altogether inconſiſtent with the idea of infinite and almighty power. What limited being would have made ſo imperfect a ſyſtem if he could have made a better? What moderately good being would have ſuffered ſo much evil to prevail, if he could have prevented it? Far leſs would a being who is infinitely great, infinitely juſt, and infinitely good. Such a ſuppoſition is entirely irreconcileable with ſuch a character.

On the other hand, if we admit the independent character of matter, and conſider the Deity as tied down by the nature of his materials, we ſhall find every thing conſiſtent with the higheſt character of excellence that ſuch a ſtate admits. We ſhall perceive the diſplay of ſo much wiſdom and goodneſs, as muſt excite the moſt unbounded admiration and adoration, as well as reverence and love. If we conſider the material powers as independent and unchangeable in their nature, and that inſtead of matter bending to the will of the Deity, the plan of all his works is adapted to its ſtubborn character, we ſhall then be able to explain the various operations of nature, and to account for the exiſtence of that evil and imperfection which prevail. If we conſider the Deity as only a limited power, we ſhall then view him as a ſkilful chemiſt, always working by means of the powers of matter: and that this is his mode of operation, nay, that he cannot act otherwiſe, appears certain, as he has been under the neceſſity in the formation of his works to take the moſt circuitous routes in order to direct the operations of the material powers to that channel in which only they can work. It is entirely on this account that the aſſiſtance of the mechanic powers is ſo often called in, and that ſo much machinery is employed.

Perhaps it may be ſaid, that the Deity has employed ſo much machinery merely to diſplay his exiſtence and intelligence, which otherwiſe ſhould not have been ſo manifeſt. This is to ſuppoſe, that he could have deviſed no more probable and certain means to evince his exiſtence and his attributes; yet we find that it has but imperfectly anſwered this end, as atheiſm has too much prevailed. This ſuppoſition would have been more feaſible, if the character of the work had been equally or more perfect by this machinery than it would have been without it: but as it is both leſs perfect and leſs durable, and ſo liable to diſorder on this account, it is impoſſible to admit ſuch a concluſion. It is ſtrange and preſumptuous to imagine that he made his works temporary and imperfect, merely to ſhew his capacity and to manifeſt his exiſtence. It muſt ſurely be admitted to give a very equivocal repreſentation of infinite and almighty power.

It is eaſy to account for the machinery of the animal and vegetable frames, on the principle that the power of the Deity is limited. We have already ſeen, that when combination becomes permanent, matter remains at reſt. In order to maintain a regular courſe of permanent action, there muſt be a conſtant circulation, an influx of new matter, and an expulſion of the old. To procure this ſupply, to maintain this circulation, and to carry off this waſte matter; all this machinery becomes neceſſary. This accounts for the dangers to which life is expoſed, and ſhews that from its nature it muſt be very temporary, becauſe the ſolid parts of the ſyſtem, which can neither be changed nor renewed, in proceſs of time become unfit for the action they are required to perform. By this theory we are enabled to account for the convulſions of nature, and the unavoidable ſufferings of animals by earthquakes, volcanos, peſtilence, famine, heat, cold, and caſualties of a ſimilar nature; as the powers of matter muſt ever act according to their nature, and becauſe it is not in the power of the Deity to change them. Theſe evils would never have been admitted into the ſyſtem if they could have been avoided. The

Deity has done every thing poſſible to provide for the wants and to promote the happineſs of animated beings: but as he could not, without poſſeſſing almighty power, change the nature of things, it was impoſſible to extirpate miſery and want from the earth.

Again: if we turn from the natural to the moral world, we ſhall unravel by this clue the prevalence of vice. The taſk aſſigned to man, the labour of cultivating and improving the earth, requires ſtrong paſſions and a high degree of ſelf-love. But this ſelf-love, wrought upon by the diſcordant intereſts which ſo frequently claſh, muſt inflame the paſſions, lead them into error, and produce irregularity and exceſs. This cannot be avoided without changing the nature of man. And if to prevent theſe you would eradicate the paſſions, and deſtroy this ſelf love, the cure ſhould be worſe than the diſeaſe; man ſhould be totally incapable of maintaining his rank and performing his allotted taſk.

It is evident, then, that tho' the character of the Deity can never be explained on the principle of infinite and almighty power, the whole ſyſtem harmoniſes and appears beautiful on the principle for which we plead. According to this view, the evidence of imperfection and the prevalence of evil do not at all militate againſt the exiſtence of the Deity, or the purity of his character, becauſe it ſuppoſes that every thing poſſible has been done to prevent theſe: but the opinion of infinite and almighty power clearly implies a power to prevent every evil and to accompliſh every good, and conſequently muſt exclude every claim of a being who poſſeſſes the one and does not prevent the other, to the title of being either juſt or good. No wonder that the exiſtence of ſuch a character ſhould be denied. It is not becauſe the Deity is great, juſt, and good, that his exiſtence has been called in queſtion; but becauſe the prevalence of ſo much evil contradicts the idea of his being both almighty and good. The ſcrutinizing mind perceives an inconſiſtency between the character aſcribed to him and the principles of common ſenſe; and as it is impoſſible to eradicate the impreſſions of the latter, it therefore rejects the former.

It is a dangerous error to ſuppoſe that the higher we exalt the Deity, his exiſtence will be the more apparent. This is contrary to all the common rules by which we judge. The more inconceivable and wonderful any thing is held out to be, the leſs it is entitled to credit. Divines have not duly conſidered, that by aſcribing to the Deity theſe extravagant and contradictory properties, they render the belief of his exiſtence the more difficult.

The idea of a creative, an almighty and infinitely good being is ſo contradictory to what we perceive in the univerſe, that it has in all ages been the ſtumbling-block of the ſerious inquirer and the vaunt of the atheiſt. It affords the latter a weapon with which to fight his battles to great advantage. Take from him this, and he is equally incapable of offence and defence. His prejudices will no longer find a ſtrong hold in which to retire when cloſely purſued; and driven from this rampart, he muſt either yield to the force of the evidence or abandon the field. Diſpel this cloud which has ſo long obſcured the ſubject, and the blaze of light which will then break forth ſhall render it equally impoſſible to deny the exiſtence of the Deity as the exiſtence of the ſun when he ſhines at noon day*.

This view of the character of the Deity entirely exculpates him from the charges of caprice, cruelty, and injuſtice. It not only explains the neceſſity of planetary arrangement, and all that machinery made uſe of in the more minute parts of his works, but it throws light upon the whole ſyſtem of nature. It leads us to fixed principles and to a rational mode of judging, and will accompany us as a guide in all our ſubſequent inquiries. If it be not the mariner's compaſs, it is at leaſt the polar, ſtar to direct our courſe thro' the vaſt ocean of the univerſe. If we conſider the ſyſtem not as perfect, but as improvable, we can rationally indulge a hope that many of the evils, both of the natural and moral world, may be greatly ameliorated, if not extirpated; and I entertain a ſanguine expectation that our future inquiries ſhall tend ſtill further to illuſtrate the ſubject, and to obviate ſome objections, ſuch as thoſe which may be ſuppoſed to ariſe from the inſtitution of the carnivorous tribes of animals, &c.

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* Since this chapter was written, I have read Mirabaud's System of nature; and with the exception of what is said upon those attributes on which I have animadverted, and on the subject of motion formerly discussed, there is not in his whole work, as far as I recollect, an argument that is worth attention. Every thing is inrolled under the dark banner of necessity,—an equivocal phrase as in this case applied, which, without explaining any thing, is made to account for every thing in a general way. But we have already seen, that when this necessity is brought to the test, it is entirely unfit to account for the phenomena of nature.

Let not this qualified view of the power of the Deity be thought to degrade him: on the contrary, it makes him appear more conſiſtent, amiable, and good. The mere character of greatneſs can never produce love and regard: the name of the powerful tyrant excites nothing but dread and horror: we can never ſerve him with a willing mind, and men will always fly from him if they can. It is the benevolent, the juſt, and the good alone, that can draw out thoſe warm affections; and produce that eſteem which is the foundation of willing obedience. Altho' we reject the plea of infinite and almighty power, the Deity ſhall ſtill appear ſufficiently great for all the purpoſes of rational piety. His inconceivable power and greatneſs are ſtill ſufficiently apparent to impreſs us with the greateſt reverence; and his wiſdom and goodneſs to inſpire us with the moſt genuine gratitude and love. The rejection of ſuch attributes as are altogether contradictory to the character of his works, will remove the greateſt obſtacle to true piety, by eradicating thoſe feelings of terror and hatred which, whatever may be pretended, muſt ariſe from the belief of an inexorable and cruel being, who, having it in his power to prevent every evil and to confer every good, beholds the innocent child and the moſt harmleſs animal ſuffering indiſcriminately with the moſt hardened ſinner, or the moſt bloody tyrant.

The idea of limited power is not only more eaſily reconciled with the exiſtence of evil and the imperfect ſtate of things, but it is in every view more deſirable and conſolatory, as it is calculated to beget more confidence in the Deity. The view of an infinitely great power voluntarily permitting evil, is only calculated to produce, as already ſtated, the very oppoſite of confidence; but if we believe that this being has done every thing poſſible to prevent evil, and that, though the ſyſtem of his works is not made perfect, it is yet improvable, the higheſt degree of admiration and confidence is called forth.

This obſervation leads us to conſider another queſtion concerning the Deity, which is as important as any one of thoſe which Dr. Clarke has diſcuſſed, namely, Whether the Deity be improvable or not?

On examining the nature of mind, I am led to believe, that it is as natural for it to improve as for matter to combine. Wherein lies the excellency of mind, except in that improvement of which it is ſuſceptible? The mind which is not capable of improvement does not deſerve the appellation. None but the lower ſpecies of brute animals can be ſaid to be deſtitute of it. The higher a mind is, it muſt be ſuppoſed to be the more capable of this quality; and it is abſurd to ſuppoſe the Deity to be deſtitute of that excellence which conſtitutes the glory of mind.

The idea of improvability is indeed contrary to the character of abſolute perfection, becauſe a being that is altogether perfect cannot be improved: but as we have ſhewn that the ſyſtem of nature is not abſolutely perfect, it can never ſupport the opinion of the Deity being incapable of improvement. I would not, however, be underſtood to ſuppoſe, that becauſe the Deity may ſtill be capable of improvement, he is in no very high degree removed from ourſelves. To check all preſumption on that head, we have an unequivocal ſtandard of compariſon, which, when ſimply viewed by itſelf, places us at ſuch an unconceivable diſtance from our Maker, that we are in no danger of forming a low eſtimate of his character. Let us only compare the miniature and paltry works of men with thoſe of our own globe or the univerſe; and let us reflect, that while the moſt durable works of men moulder and decay like themſelves, the works of nature poſſeſs a renovating principle, by which, for aught we know, they may exiſt forever, and be as durable as the matter of which they are compoſed. The man who duly conſiders theſe things can never entertain low notions of the Deity, or form a high opinion of his own powers. But however high we may place the ſupreme being in our eſtimation, we are not warranted to ſuppoſe, that the higheſt ſtandard is already reached, or that he is not endowed with that quality which conſtitutes the glory of man, and which alſo ſeems eſſential to a high degree of mind.

It muſt be acknowledged, that if we reſemble the Deity in any thing, it is in the conſtitution of our minds: and as improvability is its grand and diſtinguiſhing feature, it is impoſſible that his character can ſuffer by being thought improvable, nor can it all tend to leſſen the diſtance betwixt him and us; for as his capacity is beyond all compariſon greater than ours, in like manner the ſphere of his comprehenſion and the objects of his ſtudy are incomparably greater. If we wiſh profitably to examine the nature of intellect, we muſt look narrowly into our own mind, for by this alone we can know any thing at all of the ſubject: and on the moſt ſuperficial view it will found, that our minds are in conſtant activity and employment. We may as well think to preſerve animal life without perſpiration as mind without exerciſe. What is the intention of nature by giving to mind this property of activity and conſtant action? The ultimate object of man, without doubt, is what he conceives to be happineſs; but the deſign of nature is his improvement. The idea which man generally forms concerning happineſs is mere enjoyment, an object which he ſeldom, perhaps never, ſatisfactorily attains; for when he reaches that which he formerly purſued, his mind, ſtill reſtleſs, roams in ſearch of ſomething new. What he formerly panted after he frequently diſdains, at beſt he is ſoon cloyed; and were there nothing future to hope for, he ſhould be miſerable indeed. An unalterable ſameneſs produces ſatiety, ſatiety makes exiſtence diſguſting, and the unhappy being reduced to that ſtate becomes weary of life.

It is evident from theſe conſiderations that the happineſs which man enjoys is chiefly in proſpect:

he neither reſts ſatisfied in the retroſpect of the paſt nor in the poſſeſſion of the preſent. From ſuch reflections we are apt to view the lot of man as truly miſerable, and to conclude that happineſs is unattainable. But the truth is, we do not apprehend wherein it lies: we do not conſider that real happineſs conſiſts in the purſuit of the future, and that this conſtant purſuit is the great ſource of improvement. This diſregard of preſent enjoyment is very evident in children: their leading feature is an unſatiable deſire for ſomething new. Where this principle is encouraged, and proper food prepared for it, it increaſes with their growth, and never ceaſes but with their life. This bent of the mind has been too much overlooked and neglected, and is greatly checked when the means of improvement are wanting, or when the mind is led to purſue unprofitable objects. Where this is not the caſe, and if we be not miſled by vile paſſions, the animal appetite does not more ardently deſire food than the mind pants after the increaſe of knowledge.

That the operations of mind muſt have a natural tendency to produce improvement is evident upon the ſlighteſt view of its capacities. Mind is capable of the moſt active and volatile motion, as well as the moſt laſting exertion. In the acquiſition of information its powers are unlimited, and, in proportion to its efforts, its capacity is augmented, by its wonderful faculty of retaining what it acquires without leſſening its powers or its reliſh for freſh ſupplies of knowledge. It can turn itſelf to all ſides; it can retrace the paſt, examine the preſent, and judge of the future. What are the advantages of this threefold power? This capacity of our mind enables us to unite a great variety of things together, and thus to make compariſons. It teaches us to avoid former errors, and to ſecure former advantages; to unite the paſt with the preſent, and to graſp at the future: it leads us into paths which otherwiſe we never ſhould have trode, and enables us to acquire a vaſt variety of ideas which but for this we never ſhould have obtained: it inſpires us with new deſires, and excites us to a diligence which preſent neceſſities could never produce: it forms mind into a kind of ſtorehouſe, which is conſtantly accumulating, and conſequently improving. This reſtleſs activity, this plodding and contriving, this love of variety and thirſt for every thing that is new, are the great ſources of improvement; and it will always be found, that as they are the means of increaſing our enjoyments, ſo they alſo form the principal part of theſe themſelves.

As nothing can be more certain than the original bent and capacity of mind for improvement, there is nothing more evident than this, that nature has provided abundantly for the gratification of this propenſity. Variety is the prevailing principle throughout all nature: There is not only a great variety of kinds of matter, poſſeſſed of different powers, capable of being varied into a vaſt number of different combinations, varieties of earths and minerals, of animals and plants, of elements, climates, and temperatures; but there is alſo the probability of a variety of ſuns and of ſolar ſyſtems. We are at leaſt certain of a variety of planets and ſatellites, which, on account of their being ſo differently ſituated with regard to the ſun, may be ſuppoſed to differ in the conſtitution of their inhabitants.

Can we ſuppoſe that all this variety is made for man, or for beings like him? This would be vanity indeed; but the ſuppoſition muſt fall to the ground, when we conſider, that it is extended far beyond his capacity, or that of any beings ſuch as he is. Not only are the ſun and other planets beyond his reach, but there are innumerable things even on the earth which defy his curioſity; and the ocean poſſeſſes ſtill greater varieties of animals, beſides other productions, which he is forever phyſically precluded from examining, or from becoming acquainted with their economy. There is indeed enough provided for him; he may forever employ himſelf, and ſtill leave abundance. But it is evident that this vaſt extent, this aſtoniſhing variety, could not have been provided for him, or it muſt be in a great degree uſeleſs.

For what purpoſe, then, have all this variety, this labour, this contrivance and ingenuity been diſplayed? Surely for no trifling purpoſe; and ſtill leſs can it be ſuppoſed that it has been for no purpoſe at all. It is not ſufficient to ſay, it was meant to diſplay the glory of the Deity, or with the intention to manifeſt his power, as theſe motives are altogether unſatisfactory.

Mere greatneſs can never confer honour upon any being. If a ſtrong man boaſts of his ſuperior ſtrength, what merit has he in it, more than the oak has over the birch or the fir? The man who is born to an eſtate has leſs merit by it than he who has acquired one by honeſt induſtry. It is not what a being poſſeſſes by virtue of his nature that conſtitutes his glory, but that which he has acquired by ſkill and labour. The vanity of being thought great can never be applied to the Deity, becauſe it is not poſſible he can be influenced by thoſe motives which incite men to be proud. Greatneſs is always comparative; and as the Deity has none to compare, or to diſpute the point of honour with him, it is impoſſible he can be moved by the jealouſy of power, the rivalſhip of greatneſs, or any of thoſe little paſſions which produce vanity in men, and influence them to wiſh to appear great. It is therefore evident, that to ſuppoſe the Deity produced all theſe varieties which appear in nature, for the purpoſe of mere diverſion, is to aſcribe them to a motive altogether unworthy of him. It is ſubjecting him to the imputation of that love of pageantry which even wiſe men deſpiſe: and if it is unworthy the character of a great man, how unbecoming is it to aſcribe ſuch motives to the Deity? Neither is the hypotheſis able to account for the phenomena of nature, although we were to admit it; for, unleſs the beings he had made were capable of perceiving all this variety, it is in this view for ever loſt. The variety which one planet contains is more than ſufficient to ſerve the purpoſe that is gained by it, for no being ſuch as man can ever perceive more than is contained in one; [illegible]

Every view we can take of the ſubject pronounces that improvement is the only motive worthy of the Deity, or conformable to the character which is imprinted upon the works of nature. I have already ſtated, that knowledge is the food of mind, and that the body does not more ardently deſire renewed nouriſhment, than the mind additional knowledge. It will always be found, that the mind which is void of curioſity is deficient in capacity. There is no exception to this, but where the intellects are diſordered, or when the faculties decay in old age. All experience proves, that the greater the powers of mind are, curioſity is the more ſtrong, and the deſire for improvement the more ardent. In like manner we muſt ſuppoſe, that the higher any being is, and the greater his capacity, the more capable is he of improvement. The feeble mind can improve but little: many ſpecies of the brutes appear capable of little or no culture.

If the capacity of improvement be the teſt of a great mind, it is certainly erroneous to ſuppoſe that the Deity is deſtitute of that quality which confers the greateſt value on every other intelligent being. If the mind be immortal, it muſt be eternally improving; and if the Deity alone be ſtationary, we muſt, in the endleſs ſucceſſion of ages, advance to a much nearer equality with him: on the contrary, if he be improvable, the diſtance muſt always increaſe in proportion to the difference between his capacity and ours.

It is very remarkable that the facts which moſt ſtrongly tend to prove the exiſtence of the Deity, do in like manner equally ſupport the opinion of his being improvable. The facts which are moſt diametrically oppoſite to the idea of matter being the ſole agent, and which, by conſequence, moſt deciſively prove the exiſtence of the Deity, are the evidences of contrivance and the very numerous varieties which prevail through all the works of nature. The ſimplicity of material action excludes the idea of contrivance, and its unchangeable character operates equally againſt the opinion of its being the cauſe of ſo much variety. I ſhall therefore examine each of theſe as they relate to the queſtion of improvability.

1. The power of contrivance neceſſarily carries along with it the idea of improvement. A being that is not improvable can contrive nothing; for every contrivance is an improvement. What is the great object of contrivance, but to produce improvement? and if none is made, the contrivance is uſeleſs. How are improvements made, but by forming and uniting things together in a new order and on new principles? and this can only be done by contrivance. Every new idea illuminates or improves the mind; and as every

contrivance produces new ideas, it cannot fail to to improve. What is intelligence? It is a collection of knowledge: and how can this collection be acquired, but by experience? And what is experience, but another word for improvement? It is evident from theſe principles that contrivance and improvement are mutually connected, and if we admit the Deity to be the great framer of the ſyſtem of nature, we cannot deny that he is capable of the higheſt degrees of improvement. Can we ſuppoſe that all the combinations of matter ſhould have been made before his eyes, if we may ſo ſpeak, without producing new ideas? Is it poſſible that mechanical power ſhould have ariſen from mere form without producing new ideas? Is it poſſible that animation and vegetation ſhould have appeared in all their ſplendour, beauty, and glory, without producing the ſame effects? And if they produced new ideas, they muſt have neceſſarily produced improvement, as theſe two are inſeparably connected.

2. The varieties which prevail throughout the works of nature can only be accounted for upon the idea of improvement. It has in all ages puzzled the wits of men to aſſign a reaſon for the numerous varieties of animals and vegetables which exiſt. The ſolution however is natural and eaſy upon my hypotheſis. Do not all theſe gradations, all theſe varieties appear like the work

ſmall a portion of this applauſe does he obtain! Of all the animated beings known to us, there are none, except man, that can be ſuppoſed to give him this ſcanty praiſe, or to render him theſe empty thanks: for if man has only a remote knowledge of him, other animals muſt have ſtill leſs or none at all; becauſe they are incapable of aſcending to him by that train of reaſoning by which he is known. And though man is capable of *this*, how ſmall a portion of praiſe does the Deity obtain even from him! A conſiderable number of men deny his exiſtence; and a ſtill greater number who acknowledge this, never render him the homage which is due. It is therefore impoſſible to admit this to have been the motive which influenced the Deity in the formation of his works.

It will be as unſatisfactory to ſay, that he made theſe for the mere pleaſure of beholding them. If the ſyſtem had been ſo framed that perfect happineſs ſhould reign throughout all nature, and if no evil or imperfection had ever exiſted, this ſuppoſition would have had a more plauſible appearance. But as evil is everywhere prevalent, and wickedneſs ſo much abounds, it is impoſſible this can yield him ſatisfaction more than the other. In ſhort, after every poſſible reſearch, after weighing all the other reaſons which have been aſſigned, we are obliged to adopt the opinion and it is the only kind which ſo exalted a being can poſſibly enjoy. What pleaſure is an unimprovable mind capable of? We can eaſily conceive the pleaſures of animal life; but take away this, and examine what pleaſure mind abſtractly conſidered is capable of, if it be not improvable: We know nothing of mind except by its powers; and if you take away the improvable powers of memory, judgment, and imagination, what will you leave behind? If we believe that there is but one Deity in exiſtence, he cannot participate in thoſe pleaſures which ariſe from ſociety. The only pleaſure of which we can ſuppoſe him ſuſceptible, is that of increaſing his knowledge, and enriching his mind with new diſcoveries.

All the conjectures that have been formed to account for ſo much contrivance and labour as appear in the works of nature, are altogether unſatisfactory, and below the dignity of the Supreme Being. To ſuppoſe that they were made merely to gain the applauſe of ſuch little beings as exiſt upon the earth, is entirely unworthy of his character.

This is a motive which, as already obſerved, would be inſufficient to influence a rational man; and can it be ſuppoſed to actuate the great governor of the univerſe? If ſuch could poſſibly have been his motive, we muſt admit that he has been greatly deceived and diſappointed. How compariſon affords a well-founded hope of future acquiſitions. This is the natural and neceſſary progreſs of mind. It is calculated to afford that gratification, and to produce that activity which is characteriſtic of a great mind; as alſo to prevent that laxity and ſatiety which make life diſguſting.

The progreſs of the Deity in improvement muſt be, beyond all conception, greater than ours, in proportion to the greatneſs of his powers, and to the vaſt field of obſervation and experiment which he poſſeſſes. But the greatneſs of his capacity gives no ground to ſuppoſe that the objects of his inquiry can ever be exhauſted, for if men in their ſmall field of obſervation and limited means of making experiments, can never exhauſt their objects of inquiry, the probability is that the Deity can ſtill leſs exhauſt his unbounded field. If it were poſſible that every ſubject of inquiry could be diſcuſſed, and all improvement at an end, mind would grow lethargic, and exiſtence diſguſting; but as there is no end to the multiplicity of material combinations, neither can there be an end to the reſources of mind; for if there be any thing infinite and eternal, it is this progreſs.

This view of things is much more rational than the idea of an almighty being, voluntarily permitting evils which he can prevent, and wickedneſs which he can reſtrain; while at the ſame time, he could, by virtue of his infinite power, have communicated all the good without any mixture of evil. It reconciles the character of the Deity to the principles of reaſon, and thus ſtrikes at the root of atheiſm, by removing the great ſtumbling-block to the belief of his exiſtence. It indeed makes the Deity appear leſs powerful, but it clothes him with a character much more amiable and reſpectable. We can look upon him with zeal, admiration, approbation, and love, inſtead of that terror and diſmay which oppoſite views of his character muſt always produce. It affords ſtrong reaſons to believe, that the Deity is conſtantly employed in perfecting his works, and in promoting the good of thoſe beings he has made. And if the ſyſtems be formed upon an improvable plan, there is ground to hope, that in the progreſs of time the evils which prevail will in a great degree be remedied.

Having cleared our way of ſeveral obſtacles, and eſtabliſhed ſome important principles, we may now proſecute our inquiries with every proſpect of advantage. Infinite power is a boundleſs ocean, in which we can find no pole to regulate our compaſs; and if we attempt to navigate it, we muſt infallibly loſe our courſe. But when we adopt the idea of limited power, we launch out into a placid yet capacious ſea, in which we have the poles of reaſon and common ſenſe to direct our courſe, we ſhall find it everywhere interſperſed with beautiful iſlands, planted with trees which produce the richeſt fruits, and ornamented with the moſt delightful ſcenery. We may feed upon the fruits, we may perambulate amidſt the ſcenery, and even gambol in the waters: though ſome parts are undoubtedly unfathomable, there are others in which we may ſafely wade, where we ſhall find abundance of pearls to reward our reſearch.

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We have now finiſhed our inquiries concerning Matter and Deity, and found that both ar equally neceſſary in the ſcale of being; that the material powers, without intelligence could no more have formed the planetary, animal, and vegetable ſyſtems, than the water which drives a griſt mill could have made the machinery; and that the Deity could no more have made theſe works without matter, than a millwright could have made the griſt mill without materials.

There ſtill remain ſome other queſtions connected with the ſubject which I have not touched upon, but which I do not conſider to be of equal importance with thoſe already diſcuſſed: ſuch as, whether or not there be more than one ſelf-exiſtent intelligence? and, Whether the Deity be material or not? On theſe I ſhall not at preſent venture an opinion. In philoſophical diſcuſſions, it is often neceſſary to pave the way; for we can only proceed to judge of things very remote by thoſe that are near. In the mean time, we have one conſoling hope, that the happineſs of mind is improvable with its powers;—that intelligent beings are not doomed to be eternally the ſport of the blind laws of Neceſſity—In a word, that although "mind may never become omnipotent "over matter," yet it ſhall continually approach to this extent of power.

## CHAP. III.

## OF FREE WILL.

IT is aſtoniſhing with what keenneſs philoſophers have carried on a controverſy about free will and neceſſity for ſeveral ages, without having been able to agree among themſelves.

It would indeed have been happy for mankind if free will, or human liberty, had never been encroached on, except in the writings of a few philoſophers. The world has groaned under ſlavery and arbitary power for ſome thouſand years, and the ſtrong have always moſt grievouſly oppreſſed the weak; but a complaint for the want of this natural liberty, if we may ſo call it, has never yet reached a throne or divided a church, nor has it occaſioned the ſpilling of an ounce of human blood. Although this ſlavery is only in idea, and never hinders any man from acting as he pleaſes, yet ſo dear is the very name of liberty that we ſtart at the thought of being deprived of it. We fancy that we enjoy it, and it diſturbs our imagination, or rather it ſeems to contradict our ſenſes, to tell us we have none. It will therefore be acknowledged to be a deſirable thing to try if we can eſtabliſh our right to this liberty which we ſo fondly embrace.

In diſputes of this nature, the queſtion is often perplexed, or the diſcuſſion prolonged, either from miſconception of the preciſe meaning attached to particular terms, or of what is and what is not admitted by the advocates for either ſide. I ſhall therefore premiſe, that by the term *Neceſſity*, as employed in the preſent controverſy, I mean the unavoidable conſequence of an irreſiſtible cauſe, and that the deciſions of the mind from which human actions proceed, are as much under the conſtraint of their motives, or the evidence from which they act, as the natural effects which neceſſarily follow a phyſical cauſe. When I aſſert the *Freedom of the Will*, and the liberty of human actions, I do not thereby underſtand that the mind acts without a motive, or decides without a cauſe. I mean, that the mind is not under the controul of theſe; and that when different or oppoſite motives preſent themſelves, the preference which it gives is either the reſult of arbitrary choice, or of the unreſtrained operations of its own powers.

I readily admit, that we are phyſically ſubjected to many laws of neceſſity in which we have neither will nor choice. It is neceſſary that I ſhould remain on the earth, becauſe I cannot travel to the moon. It is neceſſary that I ſhould reſpire, that I ſhould eat and drink; becauſe I cannot exiſt without the performance of theſe acts:

In the firſt caſe, nature performs the work without my aid; in the two laſt, I am obliged to give a voluntary conſent; but in all of them I am neceſſarily ſubjected to theſe laws of nature. In caſes of this kind, neceſſity will be admitted in the fulleſt ſenſe of the word: but there are caſes of a different nature where no ſuch neceſſary obligation exiſts. It is eaſy to exemplify this, and to point out the obvious diſtinction betwixt the two. I muſt indeed neceſſarily remain upon the earth, but ſtill I have my liberty to travel from one place to another: and though I am neceſſarily obliged to eat, yet having varieties ſet before me, all of which are agreeable to my taſte, I can have a choice. No man can contend that I am under the ſame laws of neceſſity in theſe two caſes as in the firſt mentioned: there are power and choice in the latter which the firſt did not admit of; and if I am poſſeſſed of power and choice, I am poſſeſſed of liberty in every ſenſe of the word. There is a plain and obvious diſtinction betwixt the two caſes; and the difference conſiſts in the one caſe in that degree of liberty and choice which I enjoy and daily exerciſe, but which has no place at all in the other. Nor is it of ſmall conſequence to me that I ſhould enjoy this liberty in the firſt of theſe caſes; for a great part of the gratification conſiſts in the conſciouſneſs of this power of liberty and choice.

It may be aſked, What is this liberty or freedom of will which we contend for? It may be defined, the power of making a choice. What is choice? It is the power of ſelecting one or more things from among others. It is evident, that where there is no power there is no liberty, and where there is no liberty there can be no choice; hence it is manifeſt, that as liberty is founded upon power, and choice upon liberty, there muſt be both power and liberty where there is choice. It is neceſſary to attend to theſe diſtinctions, which require no amplification, as they enable us to draw this plain inference, that where there are power and choice, there is and muſt be liberty; becauſe they are all links of the ſame chain. If it is aſked, Whence come the power and choice which neceſſarily imply liberty? I reply, that life gives the power, and circumſtances give the choice of action. The firſt is a property which every man is poſſeſſed of, and the laſt is what muſt often fall in his way. What is the criterion of diſtinction between animated man and an inanimate machine? The former is poſſeſſed of the power of choice, and conſequently is capable of liberty; but the latter, having no mind, is incapable of choice. The bountiful author of our being has beſtowed life and power upon us, and he has alſo placed before us innumerable varieties, that we may chooſe under no other reſtrictions than thoſe which the laws of morality impoſe, and under no other neceſſity than what muſt naturally ariſe from the conſtitution of the human mind, and its connection with the laws of matter.---The capacity of action is inherent in man. He poſſeſſes the power of examining, judging and determining; he makes uſe of arguments, he conſiders circumſtances, and he liſtens to motives, in every caſe where he has power and choice.

The weapons wherewith the neceſſarian combats his antagoniſt are motives and circumſtances; by means of theſe he tries to diſarm his adverſary, and then bind him hand and foot by the ſtrong laws of neceſſity. But the word Neceſſity is ſurely ill choſen to expreſs the power of motives. What is meant by neceſſity? If we interpret it either according to the common acceptation of the word, or as the oppoſite of free will, in which ſenſe the neceſſarian muſt underſtand it, it means a force which cannot be reſiſted, a deſtiny which it is impoſſible to change.

But though I admit that motives may be conſidered as guides which direct, I cannot acknowledge them as maſters, inveſted with the power of command. The power beſtowed upon them is only of a perſuaſive nature, and there is evidently an eſſential difference betwixt the power of perſuaſion and the dictates of a maſter. The one mildly brings forward arguments, in order to convince; and if you conceive them inſufficient, it is in your power to reject them: but the other is a ſtern despot, who takes no ſuch uncertain proceſs, as he can always accompliſh his purpoſe by ſhewing his power. Motives have only the power of influence, while dire neceſſity keeps its captives in chains. The former is a friendly guide, who goes before to point out the way; but the latter is the ſlave driver, who with his whip in his hand drives the ſpiritleſs ſlave before him, who has no other alternative than implicit obedience. You may as well expect that the lion ſhould ſpare the antelope, and quietly feed upon graſs, as that neceſſity ſhould uſe the gentle mode of perſuaſion. If the one could poſſibly be brought to feed upon graſs, he could longer be conſidered under the character of a lion; ſo if the other is reduced to a mere adviſer, it can be no longer conſidered under the character of neceſſity. In this caſe the advocate for neceſſity evidently overſtretches the power of motives, in order to make them ſubſervient to his purpoſe. I may take my friend's advice, or he may voluntarily offer it, but this neither conſtitutes him my maſter, nor makes me his ſlave. If he were to ſet up ſuch a claim upon ſuch a pretence, I am certain there is not a judge on earth but would reject it with contempt.

The very uſe of motives plainly implies a power to reject them. If there was a neceſſity to act in this mode, all perſuaſion to act in any other would be uſeleſs. In vain would the neceſſarian urge his motives; in vain would circumſtances and opportunities peſent themſelves, if we had no power to improve them. It would be abſurd to employ arguments to perſuade me to remain on earth, for I have no power to leave it; but if the ſtate of my affairs required me to go to London, it would be perfectly rational in my friend to ſtate the arguments which ſhould excite me to go thither, as otherwiſe I might feel no inclination to leave my home.

The uſe of motives, ſo far from proving that man is not poſſeſſed of liberty and choice, evidently implies the contrary. When any one uſes his whole influence in order to perſuade another to grant his demand, the world juſtly conſiders it a proof of his being deficient in power; for if the other man were wholly in his power, he ſhould have no occaſion to perſuade, but only to command. It is in the power and choice of acting by different modes that liberty conſiſts. If man were deprived of all liberty and power, reaſon would be entirely uſeleſs, and nature would have beſtowed that faculty upon him in vain. It is uſeleſs to lay down plans, if we are not at liberty to execute them; and it is equally abſurd to perſuade us to perform what is beyond our ſtrength.

It is thus evident, that the neceſſarian impreſſes things into his ſervice which do not belong to him. Motives are the inſtruments he makes uſe

[illegible] children of liberty.
[illegible] natural and inherent
[illegible] ſtudy of mechanical
[illegible] his whole attention;
[illegible] explain the grand pheno-
[illegible] Motives do not conſtitute
[illegible] only the regulator and
[illegible] movement. We muſt
[illegible] to underſtand the whole
[illegible] within him which often
[illegible] contrary motives and
[illegible] ſurround and influ-
[illegible] Motives very often ariſe
[illegible] sometimes have neither
[illegible] dependence upon ex-
[illegible] impoſſible to deny that
[illegible] ſources of human
[illegible] an object of grati-
[illegible] the power to carry
[illegible] they poſſeſs an ac-
[illegible] and a courage that is
[illegible] circumſtances may of-
[illegible] their force;
[illegible] they fly to
[illegible] muſt be deſtroyed
[illegible] that circum-
[illegible] but cannot
[illegible] of theſe
[illegible] children.

Reaſon is the agent appointed by nature to this office, and this alſo is an internal power. The authority of reaſon is never derived from circumſtances; and although it ſometimes accepts their ſervices, it as often rejects them when the conſequences would be either dangerous or immoral. Reaſon is the gift of nature, and it is the wiſe, the powerful, and the legitimate ſovereign of man. No monarch ever wielded the ſceptre with more juſtice and honour: it muſt therefore be admitted to be extremely ungrateful, either to deny its power, or to rebel againſt its authority.

If we inquire into the great ſources of human action, the power of internal principles, and the force of natural conſtitution, will be found to be much ſtronger than has been generally apprehended. Man cannot be always driven; for, as has been already obſerved, he frequently leads the way. In contempt of ſurrounding objects, in ſpite of external circumſtances, his mind wanders in purſuit of things that do not of themſelves fall in his way. He not only goes out in ſearch of new adventures, but an imaginary apprehenſion will often operate as powerfully as a viſible object: and ſurely this cannot ariſe from any thing external. His character in this reſpect is not at all ſimilar to the mere neceſſary agents of nature; nor does it accord with the character of material power, which is always invariable. A being of this deſcription can never be the mere creature of external circumſtances, or be conſidered as the ſlave of neceſſity; but as far as he acts in this manner, muſt have a free will of his own.

Theſe conſiderations render it evident, that neceſſity can have no right to lay claim to motives as being its bond ſervants, and it is fair to deprive it of the aſſiſtance of theſe auxiliaries It is but juſt that they ſhould be placed in battle array under the ſtandard of liberty, their juſt and hereditary ſovereign; and when this is done, the neceſſarian will find his forces more than one half reduced, while thoſe of his opponent are proportionally ſtrengthened, All the motives and incitements which are derived from the internal conſtitution of man are independently his own; they aſſert, they defend his liberty; and very often defy all the power of external circumſtances to turn him out of his courſe.

If we examine into the actions of any particular man, it will often be found that he acts very contrary to what might have been expected, and that the motives which generally influence others in ſimilar circumſtances have no effect upon him. What is it that produces this contrariety of conduct? The circumſtances are the ſame, and the external motives equally as powerful in the one caſe as in the other: why then do they not uniformly produce the ſame effects? The neceſſarian will reply, that theſe motives are oppoſed by others more powerful; but, as we have already premiſed in the caſe ſuppoſed, that there is nothing externally different to cauſe a contrary deciſion, the cauſe muſt be wholly internal, ariſing from the character of the man himſelf. It muſt be in conſequence of his poſſeſſing paſſions ſtronger or ſome way different from thoſe of other men.

We have already ſtated, that theſe paſſions are inherent powers, and the true ſource of liberty: they are the gifts of nature, and not the product of external circumſtances; they are a part of our frame and conſtitution; and you muſt deſtroy the man before you can eradicate his paſſions. Will you then ſeparate the man from his paſſions? Will you call that not his own which the paſſions alone produce? You may with as much juſtice cut off his legs and arms, and then pronounce him incapable of action, becauſe in this mutilated ſtate he can do nothing, as ſtrip him of the powers of his mind, and then deny him his liberty. Here is a ſource of action, not only not produced by external circumſtances, but which acts in defiance of them: he braves thoſe very motives which influence moſt other men, and chooſes out a new path for himſelf: he aſſerts his liberty in ſpite of every thing external. Will you then deny this man his freedom? Will you hold him bound by thoſe chains which he has broke, not by any borrowed help, but by his own inherent powers? If liberty is founded upon power, here is power; and as choice and variety can never be wanting, conſequently liberty muſt neceſſarily follow in the train.

External circumſtances and motives may inflame or ſuppreſs the paſſions for a time, *but they* can neither plant nor extirpate them. They are originally inherent in man; they conſtitute his ſtrength and glory; they exalt him far above the mere machine, and ſtamp his character with independence. They poſſeſs not a borrowed ſtrength, and it ſeldom happens that you need either apply the lever or the pulley to increaſe their power. Often they are too ſtrong without aſſiſtance, and were it not for their wiſe director Reaſon, would carry ruin and deſtruction before them whereever they go. I do not deny that they are capable of deriving aſſiſtance from *external objects*; theſe ſometimes irritate and inflame, ſometimes they animate and ſtrengthen them to ſuch a degree as to appear altogether irreſiſtible. No laws are able to deter, no obſtacles to reſiſt, nor danger to prevent them from purſuing their object: they give the man a reſolution, ſtrength, and perſeverance, far beyond what he is otherwiſe capable of; ſometimes indeed to ſuch a degree, as to appear almoſt preternatural. Obſerve the effects of paſſion exemplified in parental affection, or in the animated patriot, and veteran ſoldier in the day of battle. The patriot is inflamed by a love of his country; the ſoldier, by the pride of his character, or what is called ſenſe of honour; and the parent, by the love of his offspring, which is indeed the ſtrongeſt and moſt univerſal paſſion; for not only is man inſpired by it, but even the brute animals have often been known to ſacrifice their lives in defence of their young. In order to make man the mere machine of neceſſity, you muſt mutilate his mind, you muſt deprive him of his inherent power, and of his ſtrongeſt paſſions; and if you do this, he is no better than a dead carcaſe.

If man were the mere creature of external circumſtances, without that energy and independence which raiſe him above the brutes, as well as above the inanimate machine, how miſerable an object would he be, and how unfit for the taſk aſſigned him! But the man of intelligence, and endowed with ſtrong paſſions, riſes far above the cold calculation of mechanical power, or the mere effect of external incitements.

The power of exciting action muſt exiſt partly in the paſſions, or wholly in the motives which influence the man. If the power exiſts wholly in the motives, it muſt inevitably follow that action will uniformly ſucceed in proportion to the ſtrength of theſe motives, and the actions of men be as regular as the action of a machine; but we have already ſhewn, that the actions of men are often very different in the very ſame circumſtances, and even when the ſame motives as to every thing external influence them; and therefore this principle is inconſiſtent with the ſenſe and experience of mankind. We have already ſhewn, that the paſſions are extremely active, and when no object preſents itſelf, they will ſeek one out; and if they find no real object, they will take up with an imaginary one, nay, ſometimes they will prefer an imaginary to a real object. It has often been known that a beloved object has long been beheld before it excited any paſſion, and that afterwards the ſame object has been looked upon with indifference when the paſſion ſubſided. Theſe facts make it clear to a demonſtration that the mere deductions of cauſes and their effects can never account for the actions of men. There is a ſource of action inherent in man, and this principle of action conſtitutes his liberty and independence.

It will be contended, that in all caſes where the paſſions produce the motives of actions we are merely their ſlaves, and not poſſeſſed of free will. But we can never be conſidered as the ſlaves of thoſe paſſions over whom we maintain a controlling power. The love of pleaſure, and an averſion to pain, are the ſtrongeſt principles inherent in human nature, yet we are capable of conquering both. The power of conquering paſſion is one of the grandeſt attributes of human reaſon, by which our ſuperiority over the brutes is eſtabliſhed. We cannot be ſubjected by a law of neceſſity to the love of pleaſure and hatred of pain, and at the ſame time be influenced by this law to act in direct oppoſition to its principle. This would be making the law act in oppoſition to itſelf. While I acknowledge the love of pleaſure to be a law of my nature to which I am neceſſarily ſubjected, I have the power of voluntarily ſubmitting to pain. Am I compelled by this law of neceſſity to ſubmit voluntarily to pain? To maintain this were a contradiction.

My ſubmitting to pain, as far as it is voluntary, is an act of liberty; but in doing ſo I do not act without a motive, or decide without a cauſe. When I do it, it is with the view of preventing a greater evil, to which, indeed, I ſhould have been neceſſarily ſubjected: but my action is not the leſs voluntary on this account. On the contrary, if I had not been influenced by ſome motive, I cannot conceive how it could have been an act of my will. The action of my will neceſſarily ſuppoſes a motive, elſe the inference muſt be drawn that I was exerting my will upon nothing. Aſk the ſlave who has regained his freedom, in what freedom conſiſts? He will tell you that it conſiſts in the power of acting according to his own will, inſtead of that of his maſter. He will never ſay, that it conſiſts in acting without a motive; and if you contend this point with him, it will only lead him to look upon you as a fool.

I freely grant that the human mind is neceſſarily ſubjected to certain laws; but this no more implies its being incapable of liberty and choice, than the ſubjection of matter to certain neceſſary laws implies that it is only poſſeſſed of one original power. I admit that it is natural (or call it neceſſary, if you pleaſe) for man to prefer good to evil, pleaſure to pain, happineſs to miſery. You muſt acknowledge that theſe principles are by no means ſufficient to prevent men from ſuffering much evil by their own imprudence and folly, or to preſerve them in that courſe of virtue which alone can ſecure happineſs.

I have already proved the exiſtence of accident in the phyſical world, and exemplified its influence in the operations of nature. In the moral world, a ſimilar principle will be found to exiſt, which is already known under the name of *caprice*; and this is no leſs powerful in the latter caſe than accident is in the former. This caprice is not an occurrence which ſeldom happens, and whoſe exiſtence can be diſputed. There is not only a great contrariety of paſſions to variegate the ſcenery of human affairs, but there is alſo a want of conſiſtency in the character of man, which ſpoils the regularity of his features, and renders it impoſſible, in many caſes, to diſcover the ſame character, when we compare different parts of the ſame man's conduct. The earth is not more broken up, rent, and torn, by the power of accident than the human character is by caprice. If any man doubts the exiſtence of this inconſiſtency, he has only to examine the hiſtory of his own life. What is the cauſe of this caprice which is ſo prevalent, which has produced ſo much miſery, which has led the moraliſt to bewail the inſtability of human affairs, and which, there is reaſon to fear, can never be extirpated? It ſolely ariſes from the freedom of the will. Neither the laws of mind nor the power of external circumſtances can tie men down to an invariable mode of acting, nor preſerve them from thoſe deviations from their duty which is the cauſe of ſo much evil. If their actions cannot always be regulated by fixed principles either internal or external, it is impoſſible they can ariſe from the principle of neceſſity.—What ſort of a neceſſity can it be which is neceſſary at one time and not at another; which, in the very ſame circumſtances, would lead the ſame man to adopt a different mode of conduct to-morrow from what he has done to day? If all the actions of men were neceſſary, their conduct would be as regular and invariable as the motions of a mechanical engine; but having a judgment and will of their own, they muſt, as far as they are not reſtrained by ſuperior force, be poſſeſſed of liberty and choice.

I no more contend that we can act without a motive, than that, in the phyſical world, in caſes of accident, any thing can happen without a cauſe. I only ſay, that the very motives in the very ſame circumſtances which influence the ſame man to-day, will not always be able to direct him at a future period. What can be the cauſe of theſe differences? It cannot exiſt in the motives and circumſtances, for theſe have been premiſed to be the ſame; neither can it ariſe from the neceſſary laws of his nature, for theſe alſo muſt be the ſame; it muſt ariſe ſolely from the freedom and capricioufneſs of his will.

In conſidering the ſubject of *free will*, the neceſſarians ſeem to have forgot that the mind is poſſeſſed of inherent and independent powers of its own, and that theſe powers and paſſions conſtitute a principle of action in themſelves, which can act although not immediately acted upon by any thing external. This is rendered undeniable by the power of imagination, which wanders indiſcriminately among objects which do appear and thoſe which do not. Thus the mind has not only the capacity of recalling the paſt, and obſerving the preſent objects and circumſtances, but it can penetrate into futurity, wander in paths that nave never yet been trode, plan new arrangements, and form new regulations. It is this capacity which is the great ſource of improvement.

Although nothing can happen without a cauſe, it muſt be evident that ſome of the cauſes of action are derived from the powers of the mind itſelf. Among the number of theſe powers we muſt rank will; and though I admit that it is acted upon and often reſtrained by the laws both of matter and mind, yet this no more deſtroys its own power of action, than the action of one kind of matter on another deſtroys the power of that which is acted upon. The whole arguments of the neceſſarians reſt upon this,---that the will cannot act but when it is acted upon: but the grand diſtinction of voluntary action or free will, in contradiſtinction to matter, is that it is poſſeſſed of the capacity of beginning action by virtue of its own powers.

What is the will? It is the power of deciſion; now, what deſerves particular notice is, that its deciſions are not formed merely by the ſtrength of the motives, nor are they ſolely regulated by the laws of mind. If they were governed merely by the force of motives and circumſtances, the reſults would always be the ſame; and if they were regulated by the general laws of mind, the ſame circumſtances would always produce the ſame line of action. It is impoſſible to account for all the variety and contrariety of human action, without conſidering mind as poſſeſſed of a certain degree of independence, and allowing that this independence is manifeſted in the deciſions of the will.

If all the actions of men were neceſſary, there could be no improvement; for every improvement is a change—not merely a change of circumſtances, an alteration in the plan, or a change of conduct, which, by the variation, has produced an important advantage. Little does the neceſſarian conſider, that by ſubjecting all things to the laws of an invariable neceſſity, he has excluded every poſſibility of improvement; and that it is only ſo far as man is poſſeſſed of liberty and choice that he is capable of this. Mr. Godwin, when he wrote his two chapters on free will and neceſſity, was not aware that he was deſtroying the very principle upon which alone his plans for the improvability of man could reſt. Before I conclude I ſhall paſs ſome few ſtrictures upon his arguments in favour of neceſſity, which are to be found in his celebrated Inquiry concerning Political Juſtice. Mr. Godwin, it muſt be acknowledged, is no ordinary writer: his work abounds with original, bold and important truths, which are detailed in a maſterly manner; and it affords me no ſatiſfaction to diſſent from his opinion upon this ſubject.

The principle upon which Mr. Godwin ſets out is, that the human mind is ſubjected to the ſame laws with thoſe which regulate inanimate matter; and he introduces arguments drawn from hiſtory, from individual character, from ſchemes of policy, and from moral diſcipline, in order to ſupport the doctrine of neceſſity.

We have already ſhewn that man poſſeſſes, by his organization and his paſſions, an active principle, which is entirely diſtinct from the laws and powers of inanimate matter. The action of this principle, united with the other laws of nature, like a double power in mechanics, produces conſequences very diſſimilar from the ſingle action of one. This is plain, and requires no illuſtration. It is alſo evident, that human affairs are directed by men of very different paſſions; and as the agents are continually changing, ſo the conſequences ariſing from the influence of their paſſions, muſt vary along with them. Hence it is found, that the affairs of the moral world are never ſo uniform or ſo regular as thoſe that proceed from the laws of inanimate matter.

This ſingle glance explains how it comes to paſs, that not only the individual man is liable to change, but that the whole courſe of human afſtory exhibits an irregular and intermittent progreſs, ſubject to relapſes. Unleſs you adopt this view of the ſubject, it will be found impoſſible to explain how it happened, that betwixt the 4th and 10th centuries, mankind, inſtead of making progreſs in improvement, actually degenerated, and in a great meaſure loſt what they had formerly gained. On the other hand, it is equally inexplicable from what cauſe the nations of Europe have made a greater progreſs in every kind of uſeful knowledge within the two laſt centuries than for two thouſand years before. On examining the annals of the world it will be found, that not one period of hiſtory is like another; nor is this occaſioned by any regular progreſſive change, but ariſes from the irregularity which is produced by the paſſions and caprices of men. Facts are ſtronger proofs than arguments; and theſe variations in hiſtory can never be accounted for by the laws of neceſſity. All-powerful neceſſity, acting ſolely by the laws which regulate inanimate matter, can only produce a dull and invariable uniformity. The ſame external circumſtances will always produce the ſame conſequences, and one age of mankind be the mere archetype of another. It is only by eſtabliſhing the ſyſtem of human liberty, and allowing the power of the paſſions and caprices of men, that the hiſtory of mankind can be explained; and though the neceſſarian hypotheſis makes no allowance for the agency of the active powers, they appear from hiſtory to have been the chief directors of human affairs. By this view of the ſubject the whole myſtery of thoſe ſucceſſive changes which have taken place in the world are unveiled. We clearly perceive that they do not ariſe from occult cauſes, nor are they produced without a cauſe. The cauſe is obvious, and the effects ſuch as might have been expected. On the ſcheme of neceſſity the ſtudy of hiſtory would drive us into deſpair. If the horrid ſcenes which we behold of oppreſſion and miſery on the one hand, and of vice and unbridled power on the other, proceed from an invariable neceſſity ariſing from the nature of things, all Mr Godwin's hopes of the perfectibility of man, nay, what is more reaſonable, the hopes of ameliorating his condition, are loſt; and philoſophy can only bewail their fate. But the ſyſtem of liberty encourages a rational hope that thoſe very paſſions which have been the miniſters of ſo much evil, may, by the introduction of a wiſe and juſt policy, be made to promote the happineſs and improvement of man; and inſtead of ſweeping every thing before them, like an overflowing flood, they may be made to run in innumerable ſmall channels, irrigating the earth, and nouriſhing human happineſs.

This view of the ſubject affords a complete anſwer to Mr Godwin's argument drawn from hiſtory. It leads us to conſider the internal powers of man (which the neceſſarians would deprive of freedom) as the great arbiters of fate, and as conſtantly employed in diſtributing either happineſs or miſery.—Let us now examine the argument drawn from individual character.

"The character of any man (ſays this writer) is the reſult of a long ſeries of impreſſions, communicated to his mind, and modifying it in a certain manner, ſo as to enable us, from a number of theſe modifications and impreſſions being given, to predict his future conduct. Hence ariſe his temper and habits, reſpecting which we reaſonably conclude, that they will not be ſuperceded and reverſed. It will not be accidentally, but in conſequence of ſome ſtrong reaſon perſuading, or of ſome extraordinary event modifying his mind." It appears to me more juſt to conſider, that the character of any man is the reſult of his paſſions and natural talents, aſſiſted or checked by education and habit. If a long ſeries of external impreſſions communicated to the mind were alone ſufficient, why was not Nero the moſt virtuous of men, in conſequence of the long ſeries of impreſſions which the excellent precepts of Seneca made upon him? Why was not the ſon of Lord Cheſterfield the moſt accompliſhed man of his age? Can Mr Godwin perſuade himſelf, that if the celebrated Grotius had been the tutor of *any ſpecific number* of the moſt ſtupid and ignorant men of his time, that *each* might have become famous for learning and genius, by receiving a portion of the mantle of their maſter?

I grant that education and circumſtances may aſſiſt and direct, but it is nature alone that can inſpire. If fire and light were not in the ſteel, the flint would ſtrike in vain: if paſſion did not exiſt in the human breaſt, beauty would tempt in vain; if compaſſion were not implanted, in vain would charity plead.

In ſupport of his third argument, Mr. Godwin contends, " That from the ſame idea of neceſſary " connection ariſe all our ſchemes of policy, in " conſequence of which men propoſe to them- " ſelves, by a certain plan of conduct, to prevail " upon others to become the tools and inſtruments " of their purpoſes. All the arts of courtſhip " and flattery, of playing upon men's hopes and " fears, proceed upon the ſuppoſition that mind is " ſubjected to certain laws, and that, provided they " are ſkilful enough in applying the cauſe, the effect " will inevitably follow." If the ſcheme of neceſſity were founded upon truth, the ſame incitements would invariably work upon all men equally under the ſame circumſtances; becauſe, according to this principle, the power reſides in the means and not in the man; but well does the politician know, that he muſt vary his artifices, and adapt his proffers to the different paſſions and diſpoſitions of the men he deals with; which plainly proves, that the power of action is in the man, and not in the proffers which are made to him. The means applied are effectual only as far as they correſpond with his will; and if his will be not ſo inclined, or if his paſſions be otherwiſe directed, neither the policy of Ulyſſes, the eloquence of Cicero, nor the gold of the Indies, can twiſt him to the purpoſes of corruption. Can there be a ſtronger proof of the freedom of will than this? Can any thing more forcibly ſhew the abſurdity of the neceſſarian hypotheſis? The arts of courtſhip and flattery are, indeed, very oppoſite to the nature of neceſſity, but they correſpond exactly with the idea of liberty. They neceſſarily imply, that men have a power to reſiſt, and a power to act otherwiſe, and conſequently are not ſubject to the laws of neceſſity. Mr. Godwin here entirely forgets himſelf by calling in the aſſiſtance of the paſſions, and thereby attempting to uſe thoſe weapons which liberty alone can wield.

The author's fourth argument is equally inconſiſtent with his opinion. He contends, that "the idea of moral diſcipline proceeds entirely upon this principle. If I can fully perſuade, exhort, and exhibit motives to another, it is becauſe I believe that motives have a tendency to influence his conduct. If I reward or puniſh him, either

" with a view to his own improvement, or as an " example to others, it is becauſe I have been led to " believe that rewards and puniſhments are calcu" lated in their own nature to affect the ſentiments " and practices of mankind." It has been already obſerved, that the uſe of arguments and motives neceſſarily implies liberty. If I exhort and perſuade, I do it under the full perſuaſion that he has power to reſiſt, *if he were ſo inclined.* If he has power to act or not to act, to comply with my demand or not to comply *as he thinks fit*, if this is not liberty or freedom of will, I know not what it is. If I cajole him, it is becauſe I cannot force him,—in other words, that he is under no neceſſity to obey me.

We might here call on Mr. Godwin to ſhew how rewards and puniſhments, on the ſcheme of neceſſity, can be either ſubſervient to the reformation of the culprit, or uſeful as an example to others. If men have neither power nor choice, they can never become the ſubjects of moral diſcipline. To chaſtiſe them is like the laſhing of a dead body. If the ſimilitude of a dead body is rejected, I maintain, that a living body without power is equally inefficient. It is equally as abſurd to employ promiſes or threats, rewards or puniſhments, to induce a child to lift a ſtone of two hundred weight, as to call upon the dead body of a man to do it. The power can neither reſide in arguments nor in motives; it muſt either reſide in the man himſelf, or it cannot exiſt at all. If the power reſided in the arguments or motives, in the threats or promiſes, the child could equally obtain it, as well as the grown up man, and conſequently could lift the ſtone with as much eaſe. He very confidently excludes reſentment againſt the perſons of bad men, as alſo ſorrow for miſfortunes, repentance, and exhortation; but *he* ought alſo to have excluded rewards and puniſhments: for if men are by inevitable circumſtances compelled to act as they do, they are neither the objects of praiſe nor blame, conſequently not of reward or puniſhment. All commands, threats, and promiſes, go upon the idea that men have the power, *provided they have the will*, to perform their duty; and it is ſolely with a view of *influencing the mind or will* that threats and promiſes are ever made uſe of. In every other view they would be abſurd. Every man of common ſenſe comprehends and believes this: philoſophers alone, led aſtray by favourite theory, do not perceive its truth.

Mr. Godwin afterwards adduces another argument which he ſeems to conſider as important, drawn from the nature of volition, and more particularly from the ſuppoſed abſurdity of ſelf-determination. On this head he ſays, "Our external "actions are ſaid to be free when they truly reſult "from the determination of the mind. If our

“ volitions and internal acts be alſo free, they muſt “ in like manner reſult from the determination of “ the mind; or, in other words, the mind in adopting them muſt be ſelf-determined. Nay, nothing can be more evident than that that on “ which the mind exerciſes its freedom muſt be an “ act of the mind. Liberty, therefore, according “ to this hypotheſis, conſiſts in this, that every “ choice we make has been choſen by us, and every act of the mind has been preceded and “ produced by an act of the mind,” &c.

There is more ſubtlety than force in this argument: it ſavours more of the dexterous pleader than of the candid inquirer. The thread of argument is here ſo finely drawn that it breaks. Whether or not volition be produced by one or more acts of the mind, does not alter the nature of the inquiry. You may trace the ſource as far back as you pleaſe, it is ſtill an act of the mind, and ariſes from no external cauſe. You may as well deny that my hand is poſſeſſed of the power of moving, becauſe it cannot perform it without the aſſiſtance of the muſcles and tendons, as that my will is not free, becauſe it muſt be aſſiſted by ſome of the other powers of the mind. Nothing can be plainer than this, that when my paſſions excite a wiſh which my judgment approves of, I become in conſequence ſelf-determined—in other words, this act of my will is produced by the paſſions. It is in this caſe as much my own act, as if the will were the only original power I am poſſeſſed of.

Mr. Godwin denies the will to be a diſtinct faculty, and calls it "the laſt act of the under-"ſtanding, or the judgment which the mind paſ-"ſes on things that are brought into compariſon "with each other." I have no occaſion at preſent to conteſt this point, as the queſtion concerning liberty is not at all affected by it. It is in the determination and choice of action that liberty conſiſts, and whether performed by one or more powers of the mind is very immaterial as to the point in diſpute. He aſſerts, that free will would be diſadvantageous to its poſſeſſor, and contends that nothing is requiſite to make man virtuous and happy, but the improvement of his reaſoning faculty. Alas! the experience of mankind ſufficiently contradicts this. It is unneceſſary to ſeek after proofs, as every man's experience will furniſh him with examples to the contrary. The true teſt of theory is experience; and when the neceſſarian hypotheſis is brought to this trial, and weighed in the balance, it is found wanting. The moſt powerful motives and the beſt education are indeed frequently reſiſted: the paſſions and internal diſpoſitions of men too often give proof of their power and liberty; but the ſcheme of neceſſity can never be conſidered as a cure for this evil; for, inſtead of ſtrengthening the bonds of duty and virtue, it rather deprives us of ſome of the moſt powerful incitements which can influence human conduct.

I ſhall not enter upon the examination of the inferences which Mr Godwin draws from the doctrine of neceſſity, although they appear to me extremely vulnerable; nor ſhall I point out inconſiſtencies betwixt the neceſſarian hypotheſis and his arguments on the tendency of virtue. I could have wiſhed he had made the attempt he had once thought of, to introduce the language of neceſſity in his works, becauſe I am perſuaded ſuch an attempt more than any thing would have expoſed its abſurdity. He himſelf acknowledges that it would be a work of difficulty, and that much laborious ſtudy would be neceſſary before it could be accompliſhed. I am, however, perſuaded, that the taſk would be found impracticable. I cannot conceive how the language of neceſſity could expreſs all the operations of our minds. He might go as far back as he pleaſed; he ſhould be at laſt obliged to land in ſomething whoſe action the hypotheſis of neceſſity could not explain, in ſomething that is very different from mere mechanical force, in ſome original and inherent principle which cannot be deduced from any external cauſe, but muſt be reſolved into a capacity of mind itſelf, and this capacity, being free and independent, muſt ever be a ſource of liberty.

What is it that diſtinguiſhes mind from inanimate matter, and man from a mere machine? It is ſomething which is internal; it is a power which he poſſeſſes, of which volition is an important branch. All the powers of matter are ſtrictly ſubjected to the laws of neceſſity: they never have a choice of action, but muſt always act when placed in a ſituation in which they can do it. Here there is no ſuch heſitation as often takes place in the acts of mind. The impulſes of matter are inſtantaneous, and the force it exerts is always equal; but you cannot reduce the operations of mind to ſuch a ſtandard. Its action is not bound down in the ſame manner by the laws of neceſſity. Even in the very ſame circumſtances it may or may not act. I have power to walk when I chooſe to ſit, and to ſit when I chooſe to walk. I have the power to refuſe a favour equally as to grant one; but this is not the caſe in the operations of matter. The fire cannot refuſe to give out its heat, or the candle to give out its light; and the magnet muſt always attract iron; becauſe all theſe acts are really ſubjected to neceſſary laws. This is alſo the caſe with man, in as far as he is ſubjected to the laws of neceſſity; his body is weighed down to the earth by the force of gravity, in the ſame manner as the planets are drawn towards the ſun; but his mind has a power of volition which no laws of matter can explain, and which is utterly irreconcilable with the principle of neceſſity. The voluntary ſuſpenſion of action is ſo contrary to every idea of neceſſity, that no explanation can be given of it, unleſs you admit an inherent power in man which is free and independent.

According to the opinion of Mr. Godwin, "man "is a paſſive, and not an active being;" and the neceſſarian ſcheme entirely excludes the idea of exertion, and repreſents man as the mere plaything of external circumſtances acting only when he is acted upon. But this is an opinion altogether contrary to known fact. If man be really a paſſive being, how comes it that mind can never be at reſt? This is not an accidental caſe, nor does it only happen when he is excited by the preſence of external objects; there is reaſon to ſuppoſe that it continues every moment of his exiſtence, and though he ſhould wiſh to retire to a ſtate of reſt, it is not in his power, as the active principle of mind ſtill purſues him. There is an evident contradiction in the ſuppoſition of any thing being perfectly paſſive, yet incapable of reſt. It is utterly impoſſible to explain the nature or character of man on ſuch a principle; and I have already ſhewn, that he is poſſeſſed of an inherent power of action ſolely within himſelf, and it is this principle that conſtitutes his liberty.

There is one very forcible argument which I have not yet inſiſted upon, namely, the conſciousneſs of liberty which every man feels in ſome caſes, and the conviction of neceſſity which is impreſſed upon him in others. The truth of theſe impreſſions cannot be denied. They relate entirely to what paſſes within us, and concerning which we cannot be miſtaken. If we are conſcious of any thing, it is of this, that in ſome things we have liberty and the power of choice, and that in other things we have neither. It is impoſſible to confound theſe caſes ſo as to make me believe they are of the ſame nature: no ſophiſtry, no reaſoning can perſuade me that they are the ſame; and it is impoſſible to explain the difference betwixt them, without allowing a degree of liberty in the one caſe which does not exiſt in the other. Let us, for argument's ſake, make the ſuppoſition that men were free;—would they act, or would they feel, in any other way than they do at preſent? Our experience, no leſs than the impreſſions of our feelings, gives evidence in favour of liberty. We feel as if we were free, and we act as if we were free. We have a conſciouſneſs of liberty in all caſes wherein we have power and choice; whereas, in thoſe caſes wherein we have none of theſe, but are tied down by the unalterable decrees of neceſſity, we have no ſuch feeling. Let the neceſſarian explain how this takes place. This is no illuſion of ſenſe; it is the work of the underſtanding, the higheſt power in man; and it is confirmed by experience daily put to the teſt. If we are deceived in this, we can truſt to nothing, and our minds are worth nothing. Facts muſt always be held ſuperior to arguments, and experience and feeling are the ſureſt criterions of truth. Syſtems and theory are often found deluſive, and logical arguments may be drawn from falſe principles; but the natural impreſſions of our minds, the evidence of ſenſe confirmed by experience, are proofs to which we cannot refuſe our aſſent, without weakening the foundation on which all human knowledge is built. So far are we from feeling the preſſure of that neceſſity to which that theory would ſubject us, that we are often at a loſs how to act. We have a choice in our power, and our only difficulty is how to make a right uſe of it. In theſe caſes we have recourſe to all the powers of the mind; we deliberate, we contrive, not by the power of an unſeen neceſſity, but by the free exerciſe of our own internal powers. I know nothing that can be further removed from the idea of neceſſity than the operations of the mind. If this is not freedom, let them ſay what it is, or wherein freedom conſiſts. By whom is the mind bound? By itſelf alone; which is indeed a novel kind of bondage, and of ſuch a nature that it gives the mind the idea of freedom and the internal conſciouſneſs of liberty.

If the neceſſarian ſhall revert to his motives, and tell us that they are all neceſſary, and that we can do nothing without them, I have already ſhewn, that in caſes of ſtrict neceſſity motives are out of the queſtion; and that it would be as vain as abſurd to urge motives to incite me to what I could not do, or to diſſuade me from what I muſt neceſſarily perform. It is only in caſes where I have ſome degree of liberty that motives can be of any uſe. Theſe, therefore, are not the ſervants of neceſſity, but of liberty. The very uſe of them neceſſarily implies it, and that we have equal power to reject their incitements, as to comply with them. Mr. Godwin contends, that "motives muſt either have a neceſſary and "irreſiſtible influence, or they can have none at "all:" but the extravagance of this aſſertion will appear at once, when we conſider, that motives generally act in contrarieties. A number of irreſiſtibles, acting in perfect contrariety is a contradiction; for if one is irreſiſtible, and prevails, the other which is obliged to yield cannot alſo be irreſiſtible: It is only ſince the advocates of neceſſity have impreſſed motives into their ſervice, that they have enhanced their power ſo as to make them rank with the ſovereign authorities of nature. It is only owing to them that they have become our maſters, and we their ſlaves; but let us reclaim them to the ſervice of their firſt maſter, liberty, reduce them to their original ſtation, and we ſhall regain our freedom in name as well as in reality.

I have no objection to allow motives the power of influence; for this they certainly are entitled to, provided they are kept in ſubjection to the will, or to whatever the neceſſarian ſhall pleaſe to underſtand by that term. They make good ſervants, but intolerably bad maſters. Let us therefore ſhake off the yoke; let not man be conſidered as the mere creature of external circumſtances, let him not be placed on the ſame level as an inanimate machine. It is neceſſary that we ſhould know our own powers, that we ſhould claim our own rank in the ſcale of being. An important taſk is allotted to us, and we can never execute it unleſs we claim the authority and power which nature has clothed us with, unleſs we exert that activity which a ſenſe of liberty alone can inſpire, and which a ſenſe of dignity alone can enable us to maintain.

I ſhall now conclude by drawing a few inferences from the ſubject.

1. The ſcheme of neceſſity deſtroys the merit of moral actions. There is a twofold idea of excellence: the one may be called *intrinſic*, and the other *moral*, excellence. The firſt of theſe is perfectly conſiſtent with the neceſſarian ſcheme, but the latter is completely deſtroyed by it.---Intrinſic excellence is equally applicable to the brutes and to inanimate matter as to man. A horſe is ſuperior to an aſs in ſtrength and beauty, and a hatchet of tempered ſteel is ſuperior to one of ſtone, for the purpoſe of cutting timber; but but neither the horſe nor the ſteel hatchet have any moral excellence, although they are both poſſeſſed of real intrinſic value. The moral merit of an action reſpects the intention only, and ſo far as the actor proceeds without intention, he cannot be conſidered as either good or bad in a moral view. This view of moral merit correſponds exactly with the idea of Mr. Godwin himſelf, who illuſtrates the point by a very apt example: "Judas's act (ſays he) in betraying Chriſt, according "to the Chriſtian ſyſtem, may be regarded as a "real and eſſential cauſe, conducing to the ſalva"tion of mankind; yet Judas's act was not virtu-

" ous, but vitious. He thought only of the forty " pieces of ſilver, the price of his treachery, and " neglected every conſideration of public utility " and juſtice." The murderer is puniſhed with death, while the manſlayer is acquitted; becauſe the former intended to kill, but the latter only did it accidentally. The ſtroke of a machine which is moved by water, or by ſteam, will kill a man as effectually as the ſtroke of a club, directed by a human hand; but the one agent is capable of no moral guilt, while the other is juſtly held to be a murderer.

In all ages, men have conſidered the intention as conſtituting either the merit or the criminality of actions. This view is interwoven in all our ſchemes of policy, in our ſyſtems of juriſprudence, and in all our ideas of moral diſcipline; it is even ſo deeply rooted in our natural feelings, that no ſophiſtry, no theory, can eradicate it. All men diſtinguiſh betwixt what happens by accident, and that which is produced by deſign: we can make allowance for the one, and reſent and hate the other. Now, what is it that conſtitutes the difference betwixt the two caſes but this,—that the one is conceived to be an act of liberty, and the other not. The one is performed by a hand poſſeſſed of the power of voluntary action, while the other has been impelled by the neceſſary laws of [illegible]. It is vain to go back in ſearch of remote cauſes, and to deny that man is capable of action and exertion. You can get no further back than the man himſelf; and you will find that the original cauſe exiſts in his paſſions. Here is the root of the evil—this is the ſource; and if you ſeek for active power, or capacity of action, you will find it in his natural endowments, in his muſcles and tendons, in his power of voluntary action.

I have already ſhewn that the idea of rewards and puniſhments, as applied to a mere neceſſary agent, is altogether abſurd. If a man *acts by the* ſame laws as inanimate matter, it is as *unjuſt* and equally unprofitable to puniſh him for crimes committed by the ſame laws of neceſſity, as it would be to break the machine that had killed a man; and it is equally an error in our laws of juriſprudence to diſtinguiſh between *manſlaughter* and murder. On the other *hand, according* to this view, the man of unblemiſhed virtue has no more moral merit than the horſe poſſeſſes in his ſtrength and beauty, or the ax in its ſharpneſs; and we muſt conſider the two Antonines as no better men, in a moral view, than Caligula and *Nero.*

2. The ſcheme of neceſſity tends greatly to weaken the incitements to virtue. I ſhall not, dwell upon the queſtion whether ſelf-love be either the ſole or the chief motive to virtuous actions, or not. It appears to me to be as abſurd, to reſtrict the powers of mind to one principle, as to reſtrict the powers of matter to one kind of action. Self-love, if not the chief, will at leaſt be allowed to be a very powerful principle. It is implanted in all animals for the beſt of purpoſes, and is indiſpenſibly neceſſary for their preſervation. Self-approbation and the approbation of others, is no more than the fair retribution which is due to the man of virtue. It is as juſtly due to him, as the wages of the labourer is due to his toil; and I believe he is no leſs apt to complain when any part of it is denied him. An ambition to poſſeſs merit and to excel, is the nobleſt aim of ſelf-love. This is a channel in which it may be ſafely allowed to run. It is in this channel that the politician, the governors of nations, and the teachers of youth ſhould direct the paſſions. But the ſcheme of neceſſity, by deſtroying merit, cuts off one of the moſt powerful incentives to virtue.

It is vain to attempt to find a ſubſtitute: this is the ſpring of action,—the principle implanted by nature. And if an opinion be held that men are neceſſarily inactive, and that they are in all caſes only ſecondary cauſes, ſuch a principle muſt weaken theſe ſprings, and render them inactive. If men are denied the juſt reward of their labour; they will ſoon grow weary of working; and if they are perſuaded, that the thief and the murderer are no more objects of reſentment than the moſt inoffenſive man, they will ſoon learn to give looſe reins to the baſeſt of paſſions. On the other hand, when they once obtain a ſenſe of merit, when they acquire a character for honeſty and humanity, this of itſelf acts as a powerful preſervative from vice and an encouragement to virtue. A reputation thus acquired, a principle which diſdains every degree of baſeneſs, collecting ſtrength by time, and daily adorned by acts of virtue, is the glory of human nature.

§ 3. The neceſſarian ſcheme greatly impairs the vigour of action. Nothing is more unfavourable to human action than the opinion that we want power. If I believe that I am incapable of performing any thing, I ſhall never attempt it. If I were to wait until ſome external circumſtance incited me to finiſh this page, I am ſure it ſhould never be performed.

There are two things neceſſary to the vigour of action,—capacity and volition. Capacity implies inherent power, and power is the ſource of liberty. Volition is the very oppoſite of neceſſity. If I am willing, it is uſeleſs to uſe force; but if I am compelled by any neceſſary law to the performance of any thing, my will can have no place. The taſk which every man has to fulfil requires his utmoſt exertion; but the conſtitution of his mind is ſo fitted for it, that his happineſs depends upon its execution. Idleneſs is the bane of human happineſs. The man who is not fully employed cannot be happy; and without active volition, every uſeful employment would degenerate into toil. Volition is indeed in ſome degree inherent in man; for as he has always deſires, ſo is he always willing to gratify them. If the will can thus be inclined, and if the paſſions can be excited, action becomes eaſy, duty becomes light; an ardour is kindled which no difficulties can diſcourage, and which no dangers can appal: but it is evident that this can never be produced by the ſcheme of neceſſity. It is the genius of liberty alone that can effect it. It is by inſpiring a juſt confidence in our own powers, and not by denying altogether the exiſtence of power and the capacity of action, that this can ever be accompliſhed.

Permit me now to call upon the neceſſarian to reconſider the ſubject. Let him attend more fully to the wide differnce betwixt animated man and inanimate matter, betwixt the laws of neceſſity and the dictates of caprice; and he ſhall find that there exiſts a power of action in the one which has not been diſcovered in the other; that this power contains in itſelf a principle of action, which enables him to enjoy a very conſiderable degree of liberty and choice, which the other is not capable of. On this principle alone all our ideas of moral duty and diſcipline are founded. If there were no difference in the principles of action, it would be as abſurd to apply moral diſcipline to man as to a piece of inanimate matter.

This controverſy will not, however, be found uſeleſs to mankind. The importance of circumſtances and the power of motives had perhaps never before been fully preſented to view: it is neceſſary that theſe ſhould be attended to in order to obtain juſt views of human nature; and we are obliged to the neceſſarian for bringing them under review. It leads us duly to appreciate the importance of wiſe laws, a juſt government, and good morals, in the formation of the human character; and enables us to perceive, that unleſs theſe things are enforced, the people in general can neither be virtuous nor happy. But while we calculate the force of external circumſtances, we muſt not forget the internal powers of man. Theſe will be found different in different individuals, and muſt be particularly taken into account when we attempt to ſpeculate on the probability of any particular train of human actions. The conſideration of this principle muſt guide the hiſtorian in accounting for the paſt, in the ſame manner as it will be found materially to influence the character of the future annals of his country.

# NOTES

## ON CHAPTER FIRST.

### A.

PAGE 6.—"*All theſe* (heat, hardneſs, ſoftneſs, &c.) *according to him, are merely ideas and ſenſa-* "*tions, which he always links together, as if they* "*were the ſame thing.*"

It may be ſaid, that by coupling together the words *ideas* and *ſenſations*, nothing more is intended than to mark them as ſynonimous; and that every author has the right to attach any meaning he chuſes to particular words: but, independent of the tautology, there is ſurely an impropriety in thus perverting the original and ordinary ſignification of language. *Senſation* is the medium of communication betwixt external objects and the mind;—*Idea* is the image of an object, which the ſenſes impreſs upon the mind. We have no word to denominate an image or impreſſion, except ſuch as alſo expreſs likeneſs or ſameneſs; for we cannot eaſily conceive figure on the wax, or reflection from the mirror, to be different in form from the ſubſtance which it repreſents to our view. Much of the argument in favour of the Berkeleyan ſyſtem reſts on this—that our ideas are not things; that the mind perceives the ſhadows or images of objects, and not the objects themſelves; and that the ſenſes are not only deceitful, but differ in different perſons—and that conſequently the appearance of an object as I ſee it, may be very unlike what it would be were I to view it with the eyes of another, which have a different colour and convexity. All this may be admitted to be true; but it is not the appearance, it is the reality of objects that forms the point of diſpute. The image of a man may be ſeen in various mirrors. In one he may appear well proportioned; in another, he may be ugly and diſtorted: in one he may ſeem gigantic; and in another he may appear like an inhabitant of Lilliput. Were we to reaſon upon the form of the perſon thus variouſly repreſented, we might be egregiouſly deceived; but we can never doubt that ſomething exiſts different from the glaſs, and is the cauſe or origin of the reflection.

When I examined the theory of Berkeley, I imagined that his opinions, although they had never been fully confuted, were buried under the altar of common ſenſe, and that the controverſy might now be conſidered as an antiquated ſubject. I was therefore at conſiderable pains to compreſs my arguments within narrow bounds, ſo as not to tire the patience of my readers; and

omitted much of that illuſtration
otherwiſe have been given. I little
a gentleman of great learning and
mployed (moſt probably at that ve-
) in digging up its aſhes from the
reviving it again with renovated ſplen-
. Drummond, in his Academical Queſ-
y decidedly adopts the opinions of
, and ſupports them with conſiderable
y.

his predeceſſor, Mr. D. confounds ſenſa-
h ideas, and denominates the latter only
ſenſations. He alſo maintains, that we
erceive nothing except our own ſenſations
ideas. But, in oppoſition to Berkeley's
damental principle concerning abſtraction, he
tends, that we can have no conception of
ſtance, while we only perceive and deſcribe
alities. He examines, in diſtinct chapters,
ubſtance, matter, the diſtinction betwixt primary and ſecondary qualities, ſolidity and impenetrability, extenſion, motion, and the different ſenſes; and he never fails to take advantage of the miſtakes and errors of his opponents. It is, indeed, by means of theſe only that both Berkeley and he have been able to ſupport their opinions with any degree of plauſibility.

It would be prepoſterous to attempt, within the limits of a note, to follow this very acute writer through all his ſubtleties: nor is this neceſſary, as the whole matter in diſpute may be reduced into one point. Admitting it to be true, that we perceive nothing in bodies except qualities, I deſire to be informed, how we can perceive theſe, without at the ſame time diſcovering what is called matter. We can no more have qualities without ſubſtance, than ſubſtance without qualities; nay, we can no more have qualities without ſubſtance, than thought without mind; and we may as well attempt to ſeparate thought from mind, as qualities from ſubſtance. If you deſtroy mind, you alſo deſtroy thought; in like manner, if you deſtroy the ſubſtance of any body, you alſo deſtroy the qualities of which it is poſſeſſed. The old axiom, that nothing can produce nothing, was never more applicable in any caſe than the preſent; as it is obvious, that that which has no exiſtence cannot be poſſeſſed of qualities.

If we attempt to analiſe the qualities of bodies which are perceptible to ſenſe, the ſubject will appear ſtill more perſpicuous. What is that quality called Figure? but the perception of the extremities of bodies; or extenſion? but the perception of their ſuperficies. What is ſolidity? but the condenſation of the particles of matter into maſſes called Bodies. What is hardneſs or ſoftneſs? but the greater or leſs degrees of ſolidity; and roughneſs or ſmoothneſs? but the greater or leſs degrees of inequality in the ſurface of bodies. What is colour? but the reflection of particular kinds of light? What is ſound? but the action of ſome of the component parts of air upon body. What produces taſtes and ſmells? but certain properties ariſing from the particular nature of the ſubſtances from which they proceed.

In order to decide the controverſy, it is only neceſſary again to make an appeal to the experience of every man, if he can poſſibly perceive a ſingle quality, without at the ſame time obtaining the idea of a material object. We are not entitled to admit the teſtimony of ſenſe as to the exiſtence of qualities, and to reject it as to the exiſtence of the ſubſtance which produces theſe. You can ſeparate in idea one quality from another, but you cannot obtain the perception of any quality, without the perception of body; becauſe without body you can have none of the perceptions of ſenſe at all.

Before Mr. D. can be entitled to deny the exiſtence of matter, he muſt be able to ſhew how we can have ſenſation without body, and qualities without ſubſtance; and till this be done, we ſhall do well to keep faſt hold both of ſubſtance and body.

The attempt to ſeparate qualities from ſubſtance is in the higheſt degree unwiſe. It is that kind of philoſophy which, inſtead of enlightening, tends to darken, the underſtanding; and, inſtead of explaining the ſyſtem of nature, only confounds our ideas. Subſtances may, and often do, poſſeſs qualities not perceptible to ſenſe; but we never perceive qualities without at the ſame time receiving the impreſſion or idea of a material object. Mr. Drummond aſſerts, that "to aſſign "cauſes for every thing, has been the vain attempt of ignorance in every age." It is certain, however, that nothing can exiſt without a cauſe; and a ſelf-exiſtent being or thing, though it does not exiſt by an external cauſe, has the cauſe of its exiſtence in itſelf, and cannot, therefore, be ſaid to exiſt without a cauſe. It muſt be a greater abſurdity to ſuppoſe that any thing can happen without a cauſe, than to aſſign it to a wrong one. Scepticiſm is, in my opinion, more dangerous than credulity. The error of a zealot may be corrected by inſtruction; but how ſhall we be able to convince the man who believes in nothing? If we reject the teſtimony of ſenſe as to the exiſtence of matter, we lay the foundation of doubt in every other perception. Mr. D. himſelf allows, that we have no innate ideas; and if we entertain doubt and uncertainty as to objects of our perception, we can have no fixed ideas at all.

Some of Mr. Drummond's opinions concerning mind are ſo contrary to the principles I have laid down, that they would naturally call forth ſome animadverſions. Theſe, however, I ſhall defer, till the ſubject come before me in the regular courſe of my inquiries; before which, it is to be hoped, the whole theory of the Right Hon. gentleman will have been given to the Public.

## B.

PAGE 7. — " *The qualities of the ſugar are the the ſame.*" &c.

The qualities of bodies have been diſtributed into two claſſes,—inherent and relative. The former are underſtood to exiſt in the ſubſtance, although it were iſolated from every other being; the latter, to depend on its connection with ſurrounding bodies. I conſider the properties of ſweetneſs, ſourneſs, and bitterneſs, as alſo colour in light, magnetiſm in the loadſtone, &c. to be of the former claſs; and that theſe exiſt inherently in the matter or ſubſtances which poſſeſs them, independently of our perceptions. But there are other qualities, which cannot be ranked in this claſs, ſuch as thoſe which only ariſe from the compariſons and relative ſituations of bodies. The ſame body may be called either ſoft or hard, when compared with other bodies which are harder or ſofter. A mountain may be ſaid to be either eaſt or weſt, as it is compared with objects lying in oppoſite directions to it; and to be great or ſmall, in proportion to the ſize it bears when compared with other mountains.

The exiſtence of the former of theſe qualities ſeems to be denied by Berkeley and his adherents; and they can eaſily diſpoſe of the latter ſo as to favour the non-material hypotheſis. But ſhould we even admit that all the qualities of bodies were relative and comparative, it would not follow that the things which we perceive have no exiſtence. Nonentity can be no ſubject of perception: it is even incapable of conjuring up the ſhades which conſtitute the phantaſms of the ideal world. No man can reaſon with another, unleſs he can recur to certain indiſputable axioms; neither could we, from the conſtitution of our nature, obtain any perception, unleſs there exiſted material objects. The conception of ſomething beyond ourſelves is as neceſſarily impreſſed upon the mind as the conſciouſneſs of our own exiſtence.

In my obſervations on Viſion (p. 15), I declined entering upon the queſtion, Whether it be the real object, or only an image of it, which we perceive; becauſe I judged that the latter opinion, although proved, could never be a foundation for the theory of Berkeley. I have yet but ſlightly conſidered the queſtion; but at firſt ſight there appears ſome reaſon to ſuppoſe, that we only perceive an image, and not the real object of viſion. Not only is it proved by experiment that an image is always formed upon the retina (which is of no uſe if it be not neceſſary to viſion), but we alſo know, that the formation of an image by a mirror will produce the moſt diſtinct viſion where the real object cannot be ſeen. It muſt, however, be obſerved, that this gives no ground to ſuppoſe that our ſenſations are produced by material action in a ſecondary manner. It is the light, and not the object, that acts upon the eye; and this action of the light is no leſs real and direct by the reflection of an image, than that of a real object.

## D.

MR. DRUMMOND makes very frequent uſe of a maxim adopted by ſome philoſophers, "Nothing can act where it is not;" which, as it is in direct oppoſition to an argument I employed when controverting Dr. Clarke's opinion concerning the character of the Deity, *p.* 238, I cannot paſs it unnoticed.

When I wrote the ſection on the character of the Deity, I was ignorant of any ſuch maxim; and, now I have heard of it, I confeſs myſelf too dull to perceive its truth. Mr. D. in order to ſet aſide the argument drawn from the attraction of the magnet, and the gravitation of the earth to the ſun, argues thus---If we be certain that there is no intermediate connecting matter ſerving to tranſmit impulſes from one body to another, ſomething elſe than matter muſt communicate the powers of matter. This is a new mode of proving exiſtence. Mr. D. is not entitled to take the negative ſide: his propoſition requires poſitive proof. We have the moſt certain evidence that the magnet, the ſun, and all matter whatſoever, act in places where they are not; but of the manner in which they exert this power, we are altogether ignorant. This, however, by no means lays a foundation for the ſuppoſition of a connecting medium. We are in no dilemma here more than in other caſes, for we know nothing of the powers of matter in general except merely by their effects; and if, in this caſe, we muſt neceſſarily ſuppoſe ſome preter-material agent, we muſt believe it equally neceſſary in every other. We no more know how light produces viſion and colour, or in what manner air produces ſound, than how matter is capable of attraction. Light and air, it is true, act directly upon the organs; but this is no proof that no other material power can act at a diſtance.

Independent of the argument ariſing from the experiments which give reaſon to ſuppoſe that there is no immediate contact between the particles of matter, the action of the magnet is alone deciſive of the point. It is found by experiment that the magnet has the power of acting upon iron, through ſolid and fluid bodies, equally as through air. I made the experiment long ago, with every ſubſtance I could think of, and found no difference in its action by the intervention of any ſubſtance whatever. This is directly contrary to the idea of an intermediate connecting vinculum. The action of all the ſubtle fluids with which we are acquainted is always, in ſome degree, ſtopped or retarded by the intervention of certain bodies; and if none be found capable of obſtructing the action of the magnet, there is every reaſon to ſuppoſe that it does not act by means of a connecting medium. In the ſun's action upon the earth, there is the ſame reaſon to conclude that no connecting medium exiſts; as in this caſe alſo, it would be obſtructed and diſturbed in eclipſes, by the intervention of ſuch large bodies betwixt them.

If attraction cannot be produced but by means of a medium, we can with no propriety ſay that bodies act at all; and we muſt aſcribe it ſolely to the medium interponed between the attracting bodies. But until the exiſtence of ſuch an efficient medium be firſt proved, we are to conſider the action as derived from the bodies themſelves; for if we muſt ſearch for occult cauſes in unknown exiſtences to explain every thing we do not comprehend in the nature of material action, we ſhall never be able to explain any thing whatever.

## E.

THE doctrine of Neceſſity, as far as regards human action, is defended by Mr. Drummond. He denies, however, the prevalence of an univerſal neceſſity, which he conſiders as conſiſtent only with atheiſm.

His arguments againſt the liberty of human action are chiefly drawn from the principle of contingency. He aſſerts, that "there can be no foreknowledge of a contingency; and if we know that any action will follow our willing it, we muſt know that the action and our willing it are neceſſarily aſſociated together. But we cannot preſume from this, that the neceſſity begins with our will. That which neceſſarily cauſes any thing has itſelf been neceſſarily cauſed; for, if it had not, that which it neceſſarily produced, and which therefore neceſſarily exiſted, might not have been, which is contradictory and impoſſible."

In anſwer to this, let it be obſerved, that free will is only contingent ſo far as regards the choice of action. When once my choice is fixed, and my will exerted, the action is no more contingent than when it ariſes from any neceſſary law of nature. Neceſſity muſt begin ſomewhere, and why not with the will? If my will be the cauſe of action, the action, and the effects produced, muſt as neceſſarily flow from it as from any other cauſe whatever. There is no truth in the concluſion, that "that which neceſſarily cauſes any thing "has itſelf been neceſſarily cauſed." We have ſhewn, in the ſecond chapter, that both in the natural and moral world, neceſſary effects are often produced by accidental cauſes; and if ſo, we can be under no difficulty to conclude that they may alſo originate in the will of man, which has ſurely leſs of contingency in its nature than mere accident.

To reject the doctrine of univerſal neceſſity, and to maintain, at the ſame time, that neceſſity cannot begin with the will of a free agent, is inconſiſtent. If it be allowed that the Deity is not ſubject to this neceſſity, it muſt originate in his will.—It is unneceſſary here to follow Mr. Drummond any further: his other arguments have been fully conſidered in the chapter on Free Will.

FINIS.

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